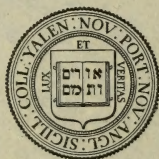


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THE
DENTAL COSMOS:

A

MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY
JAMES W. WHITE, M.D., D.D.S.

Observe, Compare, Reflect, Record.

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THE
DENTAL COSMOS.

VOL. XXII.

PHILADELPHIA, JANUARY, 1880.

No. 1.

ORIGINAL COMMUNICATIONS.

ON PERICEMENTUM AND PERICEMENTITIS.

BY C. F. W. BODECKER, D.D.S., M.D.S., NEW YORK, N. Y.

(Continued from vol. xxi. page 656.)

Hyperplasia.—An intense plastic pericementitis, or repeated attacks of a so-called subacute inflammatory process, will lead to a new formation of connective tissue, cementum, and bone. New formations due to a distinct inflammatory process, are termed hyperplasia or hypertrophy, contrary to those new formations which arise without prominent inflammatory symptoms and are generally termed "tumors." The uniform hypertrophy of the cementum, the so-called "osteoma," or exostosis of teeth—the formation of a very regular new cementum, ranks among the tumors, as no very marked inflammatory process is traceable in its formation.

Hyperplasia of pericementum occurs whenever a large number of inflammatory elements are newly formed and remain in connection with each other, thus not ceasing to be a tissue. The inflammatory elements in certain districts become elongated, and, after having split into spindle-shaped elements, are transformed into a solid basis-substance, which means a new formation of connective-tissue bundles. These bundles differ from those of normal pericementum in their greater density, and their very irregular arrangement. Hypertrophied cementum is augmented in its whole bulk, and is built up by coarse bundles of connective tissue, between which, in the earlier stages of the hyperplastic process, more or less numerous nests of inflammatory elements are seen. In other instances, the whole pericementum is transformed into a dense cicatricial connective tissue, whose bundles are very small, and, by crossing each other in all directions, produce a feltwork. Hyperplastic pericementum as a rule holds less blood-vessels than the normal.

Sometimes scattered nests of the inflammatory elements take up a high refracting power, which evidently is due to a deposition of lime-salts in them,—the so-called calcification. This process is entirely different from ossification, though the former apparently precedes the latter. Scattered nests of inflammatory elements may be transformed also into clusters of fat-granules, which are recognizable by their peculiar refracting power, and by remaining unstained by either carmine or chloride of gold. Irregularly distributed fat-globules are very often seen in hyperplastic pericementum. Whether these globules are identical with the original fat-globules in normal pericementum, or are formed after the inflammatory process has abated, I am unable to say.

New formation of cementum is observable in two forms: either as re-formation in the bay-like excavations, or as a new formation on the outer surface of the cementum.

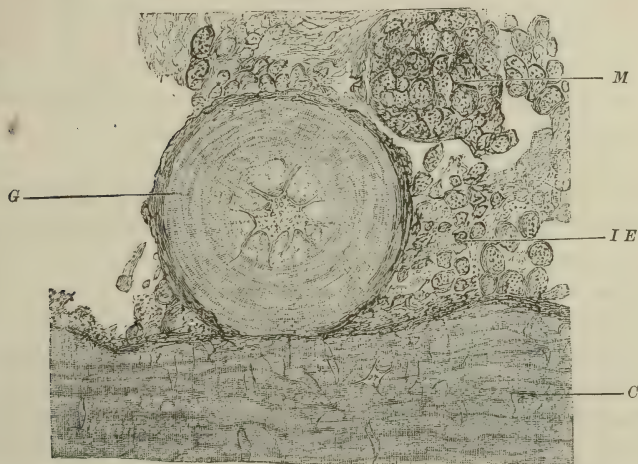
Re-formation of the cementum is always characterized by a deposition of lime-salts in the territories of the cement-corpuscles, previously dissolved by the inflammatory process. The bay-like excavations remain unchanged in their configuration, even after new cementum has formed. The difference between normal and newly-formed cementum is, that in the latter the cement-corpuscles are larger, more numerous, and irregular. In the basis-substance we not infrequently recognize the inflammatory elements (osteoblasts), the infiltration of which, first with a gluey basis-substance, afterwards with lime-salts, has caused the new formation of cementum. In the cementum of both the neck and the root I have met with such sharply circumscribed islands of newly-formed cementum, apparently with no connection with the outer surface. Nay, in some of my specimens such an island has formed on the cementum, covering the neck of the tooth, and, while the latter shows a normal structure, and is devoid of cement-corpuscles, the newly-formed cementum deeply penetrates the dentine, and exhibits a large number of irregular cement-corpuscles.

The inflammatory new formation on the surface of the cementum appears either in the shape of a continuous layer of cement-tissue, distinctly bounded towards the normal cementum, or jagged on the outer surface, with manifold elongations and erosions, filled with newly-formed connective tissue. Sometimes relatively large globular formations appear on the outer surface of the cementum as the result of pericementitis.

There are globular bodies in connection with the cementum by means of a pedicle, which closely resemble those in the pulp-cavity attached to the dentine. These peculiar formations demonstrate a distinct concentric lamination. They are surrounded by a layer of

spindle-shaped medullary elements, and hold in their centers a radiating protoplasmic mass, resembling a bone-corpuscle. As to their origin, there can be scarcely any doubt that they arise from clusters of medullary elements, or multinuclear protoplasmic bodies above described, one of which is seen in Fig. 4, in the immediate neighbor-

FIG. 4.



Globular body, result of pericementitis. *G*, concentrically striated mass, surrounded by small spindle-shaped elements, holding a star-shaped protoplasmic body in its center. *C*, cementum. *M*, multinuclear body, so-called myeloplax, from which a globular body may originate. *I E*, inflammatory elements, crowded in the pericementum. Magnified 200 diameters.

hood of the globular formation. We readily understand that a transformation of the medullary elements into bony basis-substance will lead to the formation of a laminated cement globule; the difficulty is only to understand the origin of the central protoplasmic body. Perhaps this body is a former blood-vessel solidified, the like of which we can often trace in the midst of a multinuclear protoplasmic cluster. All new formations on the surface of the cementum caused by an inflammatory process may be justly denominated "exostoses of the cementum."

I have repeatedly seen true bony new formations in hyperplastic pericementum. They appear in the shape of irregular islands or elongated spiculæ within the fibrous connective tissue, sometimes so near to the cementum that no doubt is left about their formation in the midst of the pericementum, independently of the bony alveolus. These formations bear a close resemblance to embryonal bone, viz., contain a large number of irregular bone-corpuscles with broad offshoots, and a relatively small amount of bony basis-substance. We know that the bony tissue never forms directly from fibrous connective tissue, but always from medullary elements, into which eventually

the fibrous tissue must first be converted. Indeed, on the periphery of isolated bony formations we can often distinguish the medullary elements (osteoblasts), which share in the formation of bone by being partly transformed into basis-substance.

Lastly, true bony new formations may occur on the wall of the alveolus, which, after repeated attacks of pericementitis, as clinical observation teaches, is sometimes beset with thorny new formations of bone. These exostoses originate on the socket of the tooth from the medullary tissue, in the same manner in which exostoses grow on any other bone as sequelæ of periostitis and osteitis. In the highest degree of development such exostoses of the socket replace the pericementum to such an extent that only traces of the pericementum are left. No instance, however, at least to my knowledge, has been observed of a complete fusion of the socket with the tooth.

Pyorrhœa alveolaris.—This form of inflammation is the most intense of all, and, as is well known, always terminates in the loss of a certain amount of the tissue involved. All causes mentioned, when speaking of pericementitis in general, may lead to suppuration, if the inflammatory process reaches a high degree. Some individuals are more prone to suppurative inflammation than others. Persons otherwise healthy are more subject to suppuration, especially, as it seems, if their constitution be lowered by bodily or mental overwork, or by chronic disease of different kinds. Under these circumstances even a broken root, which for many years remained in the socket without the least annoyance, may suddenly, without any traceable immediate reason, give rise to a severe suppurative pericementitis. The phosphorus vapors, if in contact with carious teeth, are well-known causes of intense suppuration of pericementum, and in turn of the periosteum.

Clinical observation teaches that suppurative pericementitis is seldom localized to one socket only, wherein the inflammatory process has started, but often the neighboring sockets are involved also, either in a purulent or, at least, plastic inflammation. We furthermore know that by the suppuration of the pericementum the nerves and blood-vessels are, as a rule, destroyed, and thus the tooth is deprived of its life.

Pus being foreign matter in the organism, is necessarily discharged in the most favorable cases directly around the neck of the tooth. In unfavorable cases pus finds its way after suppuration of the periosteum of the jaw and the covering cutaneous tissue, on the outer surface of the body, viz., in the submaxillary region. In this way obstinate and even dangerous sinuses, improperly called fistules, are formed. On the upper jaw the pus may be discharged into the antrum of Highmore, and cause severe suppuration of the lining membrane of this cavity.

Surgeons have long been aware of the fact that suppurative periostitis is the main, if not the only cause of necrosis of bone; thus, also, the consequence of suppurative pericementitis is necrosis of the alveolus, varying in accordance with the degree of the suppuration. No cure of the suppuration is possible until the necrotic parts of the bone have been eliminated from the body, either spontaneously or by surgical interference.

Under the microscope the first stages of suppurative pericementitis are identical with those of the plastic form, viz., there are nests of inflammatory elements between bundles of unchanged connective tissue. The less, therefore, of this connective tissue is left, the more numerous the inflammatory elements are, and the nearer is the tissue to suppuration. A sure indication of this process ensuing is when in the pericementum there appear large nests of inflammatory elements crowded together, with scanty remnants of former connective tissue and blood-vessels,—these are signs of the beginning of an abscess.

With high magnifying powers of the microscope we see that the inflammatory process goes on in exactly the same way as in plastic pericementitis. The bundles of connective tissue are transformed directly into inflammatory elements, which at first are all united with each other. This union of the inflammatory elements is recognizable in relatively large nests also, in which there are but scanty capillary blood-vessels left. It is only after the mutual connection of these elements is broken that the bodies, now isolated, deserve the name of pus-corpuscles, which are suspended in an albuminous fluid, and fill a cavity termed an "abscess." If a large number of inflammatory centers, which afterwards become confluent all around the root of the tooth, have formed, we designate the disease "alveolar pyorrhœa."

I claim, therefore, that pus is a direct product of the inflamed connective tissue. As to the emigration of colorless blood-corpuscles, which have been asserted to be the only source of pus-corpuscles (J. Cohnheim), I have little to say. In some of my specimens, among the inflammatory elements there are seen capillary blood-vessels, containing a few colorless blood-corpuscles, some of which, by means of a slender pedicle, have penetrated the wall of the capillary, and are evidently engaged in emigration. These colorless blood-corpuscles, however, are finely granular, and as such easily distinguishable from the surrounding inflammatory elements, the vast majority of which are coarsely granular, or homogeneous. Emigrated colorless blood-corpuscles may share in the formation of pus-corpuscles, but the main mass of the latter is doubtless formed directly from the connective-tissue substratum of the inflamed part.

Pus, then, is no tissue, and a suppurated tissue has ceased to be one, as by transformation into pus it is essentially destroyed. After the elimination of the pus the surrounding inflamed tissue grows in the shape of so-called "proud flesh" or granulations, which we not infrequently meet on the roots of teeth extracted during an attack of suppurative pericementitis, especially well developed in the bifurcations between the roots of molars. Such granulations are built up by a myxomatous connective tissue, which is freely vascularized, and after having filled the cavity of the abscess, is transformed into a dense fibrous connective tissue. Such reparative tissue is termed a "cicatrix." Suppurative pericementitis will invariably heal by cicatrization.

Alveolar abscess.—This is a peculiar form of suppurative inflammation on the apices of the roots of teeth. Its causes are the same as those of alveolar suppuration in general. It may occur in combination with pyorrhœa alveolaris or independently. Its clinical phenomena are those of pericementitis, with one characteristic feature, viz., the pain is more or less of a dull nature, and remains localized about the region of the root of the tooth. The painfulness may temporarily abate, but, as a rule, will recur after slight injuries, or the use of the tooth for mastication. If repeated attacks of such localized pericementitis have taken place, and each attack has become more painful, there being no discharge of pus around the neck of the tooth, we can readily diagnose alveolar abscess.

An alveolar abscess as such may exist for months, until, with symptoms of pyorrhœa alveolaris, it breaks into the oral cavity or upon the outer surface of the body. The pain, however, being very severe and unbearable to the patient, he seeks for help; and after extraction of the tooth or root, we see, attached to the apex, a grayish, firm saccule, in the interior of which there is a small amount of pus. It may happen that upon the extraction of a tooth or root the saccule breaks, and only vascularized shreds are found on the apex of the root. As a matter of course this inflammatory process must lead to the destruction of the vessels and nerves entering the pulp-cavity, and therefore, to the death of the pulp of the tooth. This will occur, as a rule, on bicuspid and molars also, if only one root be involved in the formation of an alveolar abscess, evidently by spreading of the inflammation throughout the socket, though resulting in the formation of an abscess on one root only.

Examination of microscopical sections through the root, the socket, and the alveolar abscess, demonstrate that the latter is either unilocular or multilocular, viz., separated into two or several chambers, all filled with pus. The wall of the abscess is built up by a very dense fibrous connective tissue, the bundles of which mainly run a concen-

tric course around the abscess, and are continuous with the unchanged or slightly inflamed pericementum higher up on the root. The sac is a product of plastic pericementitis, fully identical with what has been termed in former years the "membrana pyogena." When the inflammatory process has lasted for months, the newly-formed connective tissue assumes a distinct fibrous structure, and between the bundles there are interspersed nests of inflammatory elements. These may be partly transformed into fat-granules, or produce opaque layers in fatty degeneration. If, on the contrary, the alveolar abscess be of a more recent date, the fibrous structure of the sac is plainly marked on its periphery only, while the central portions bear the character of a myxomatous granulation tissue. The strings or the septa, traversing the abscess, may, in accordance with the age of the disease, be found either of a fibrous or myxomatous structure. In both instances we often meet with a large number of newly-formed capillary blood-vessels. The inner surface of the sac is not smooth, but largely provided with irregular protrusions, or papillary outgrowths of a myxomatous structure, crowded with inflammatory elements. The sac contains inspissated pus, which, upon the cutting of microscopical sections, crumbles away.

Cementitis and osteitis always accompany an alveolar abscess. Cementitis leads to a destruction of the cementum in the shape of deep, irregular, bay-like excavations, which exhibit all stages, from the liquefaction of the basis-substance up to the transformation of the living matter into pus-corpuscles. Sometimes the excavations penetrate the dentine. In the highest degrees of pericementitis the apex of the root, inclosed in the alveolar abscess, is transformed into a thin, jagged, and corroded stump, with but scanty remnants of the former cementum.

Osteitis (inflammation of the wall of the alveolus) is an inevitable result of the formation of an alveolar abscess. The portion of the socket in contact with the sac of the abscess is widened, its surface being either smooth or jagged. Examination with the microscope leaves no doubt that the inflammatory elements, sprung from the bony tissue after dissolution of its lime-salts and liquefaction of its gluey basis-substance, become spindle-shaped, and share largely in the formation of the wall of the abscess.

In higher degrees of osteitis the wall of the alveolus is reduced to irregular, eroded trabeculæ of bone, the outer surface of which is lined by a dense, newly-formed connective tissue, identical with that of the wall of the abscess. The neighboring medullary spaces are enlarged and crowded with inflammatory elements.

LITERATURE.—In regard to the literature of pericementum and pericementitis I have but little to say, as this subject has been very

much neglected by nearly all histologists. I shall only quote from a few of the modern authors.

From Carl Wedl's "Pathology of the Teeth," Philadelphia, 1872, page 59, I quote: "Generally the root-membrane, or periosteum of the root, is of moderate density; the bundles of connective tissue forming it contain no elastic fibers, and inclose fusiform connective-tissue corpuscles; in addition to these, roundish elementary organs are met with. According to E. Magitot ('Mémoires sur les Tumeurs du Périoste Dentaire,' 1868), the root-membrane consists of two portions: an inner, which does not admit of being teased into fibrils; and an outer, lying near the alveolar wall, which has the appearance of a fibrous structure. The same writer also mentions the occurrence of 'cellules myélopaxes,' similar to those found in the periosteum of bone, and cystoblastions (nuclei invested with a layer of protoplasm), which occur still more rarely."

Page 212: "The changes in the hard tissues of the root, which occur chiefly with chronic suppurating inflammation of the periosteum of the root, consist in necrosis and resorption, according to the nature of the tissue. If the superficial cement be not discolored, dull, whitish, indistinct spots may be observed, sometimes incorporated in it. If these are cut out in thin plates and examined with transmitted light, they present a cloudy, dirty yellow, brownish-yellow, and from this to a black-brown color. The bone-corpuscles become less discernible in the mass as the transparency diminishes; the inter-corpuscular substance is transformed chiefly into a minutely granular mass, and frequently has a foraminated appearance.

"In consequence of resorption following suppuration, the outer surface of the root becomes rough, sometimes, as it were, corroded, covered with irregular excavations; its extremity is hollowed out like a funnel, corresponding with the entrance of the canal, or sharpened to a point like a needle. The histological appearances produced by the process of resorption are displayed in a manner similar to those which were observed in the resorption of the roots of the milk-teeth,—*i.e.*, there are circumscribed depressions upon the outer surface of the cement, which are made up of groups of closely approximated, shallow, cup-shaped indentations. In the ridge-like elevations which bound the excavations well-preserved bone-corpuscles are to be found, while they become gradually less discernible in the deeper portions. Necrosis of the cement not infrequently is associated with resorption, in which case sections made in directions perpendicular to the surface of the root present spots of a dark color, and with obscurely defined margins between the excavations, produced by resorption.

"If the cement is entirely destroyed here and there by the suppuration, the dentine becomes similarly affected, and acquires a rough-

ened or corroded appearance. If the affected portions are examined carefully, they will be found to be irregularly notched with numerous cup-shaped excavations with sharp outlines, which sink into the dentinal substance, are crowded together frequently into groups, and contain the corroding pus. The adjacent portions of the dentine, with the tubules running from them, retain their normal transparency. The indentations themselves are lined with a molecular mass, which, frequently, is impregnated with a yellow, or brownish-yellow coloring matter; their projecting margins are delicately notched; their exposed surfaces are occupied by transversely and obliquely divided dentinal tubes. There are, consequently, no indications of a vital action on the part of the dentine. The theories advanced to explain the manner in which the excavations are produced by resorption are mere suppositions; *they may be regarded as induced either by the activity of the pus-corpuscles, or by a fermentation-process; with regard to the former, it is conceivable that the amœboid movements of the pus-corpuscles might wear away the dental substances; in the latter case, the generation of an organic acid might be assumed.* In chronic cases, the eroded portions are covered by a thin membrane of connective tissue or by a layer of granulation-tissue.

"Sometimes, on the other hand, the inflammation spreads from the root-membrane to the socket of the tooth; when this occurs, the canals of the latter in the vicinity of the focus of suppuration become expanded; excavations, in the form of pits and grooves, are found in it, and, finally, there ensues a partial resorption of the alveolus; which process is induced by the proliferation of the elementary organs of the connective tissue."

Page 277: "In addition to the senile form, an hypertrophy occurs as a sequel of chronic affections of the root-membrane, consisting, essentially, in a thickening, and a more or less advanced callous formation. The generally straight bundles of fibrous tissue often pursue a radiating course for the most part,—*i.e.*, they extend from the outer surface of the cementum towards the alveolar wall, forming a series of closely-packed arches, and are inserted, by a fan-shaped expansion, into the osseous trabeculæ. During their passage, the bundles inclose spaces which, likewise, are traversed by thin bundles. These are the depositories for the aggregations of ovoid cells, which, here and there, form radiated prolongations of the cavities, their number bearing an inverse proportion to the density of the thickened periosteum. Besides these latter cells, and more nearly in the course of the bundles, spindle-shaped cells occur, which have oblong, frequently fiber-like, elongated nuclei.

"The bundles of connective tissue, especially in cases of very irregular hypertrophy, interlace one with another in various direc-

tions, forming a sort of felted work of bundles, which penetrate the enlarged foramina in the alveolar wall. Cross-sections of the periosteum of this description present, therefore, numerous protuberances and conical prolongations. In consequence of the increase of the fibrillated tissue of the periosteum, its consistence becomes augmented, and it may even acquire a dentinous character, so that its tenacity and consequent power of resistance in extraction are increased.

"The fringes presented by the membrane when extracted along with the root are, manifestly, pulled out from the vascular foramina of the socket, and consist of cloudy, tough bundles of connective tissue, containing numerous, usually shrivelled, nuclei, and inclosing blood-vessels with their external coats very much thickened. They form an intimate, quite firm union between the root-membrane and the socket."

From Charles S. Tomes ("A Manual of Dental Anatomy," Philadelphia, 1876) I quote the following: "The general direction of the fibers (of the alveolo-dental membrane) is transverse; that is to say, they run across from the alveolus to the cementum without break of continuity, as do also many capillary vessels; a mere inspection of the connective-tissue bundles, as seen in a transverse section of a decalcified tooth in its socket, will suffice to demonstrate that there is but a single 'membrane,' and that no such thing as a membrane proper to the root and another proper to the alveolus can be distinguished.

"At that part which is nearest to the bone the fibers are grouped together into conspicuous bundles; it is, in fact, much like any ordinary fibrous membrane. On its inner aspect, where it becomes continuous with the cementum, it consists of a fine network of interlacing bands, many of which lose themselves in the surface of the cementum.

"But although there is a marked difference in histological character between the extreme parts of the membrane, yet the markedly fibrous elements of the outer blend and pass insensibly into the bands of the fine network of the inner part, and there is no break of continuity whatever.

"I have never seen the fibers, whether in longitudinal or in transverse sections, pass straight in the shortest possible line from the bone to the cementum, but they invariably pursue an oblique course, which probably serves to allow for slight mobility of the tooth without the fibers being stretched or torn."

RESULTS.—The results of my researches may be summed up in the following points:

I. Pericementum is a layer of connective tissue between the root of the tooth and the wall of the alveolus, and common to both.

This connective tissue in the juvenile condition is myxomatous, rich in protoplasmic bodies. In the adult it is fibrous, scantily supplied with protoplasmic bodies, the so-called connective-tissue cells. The bundles of the connective tissue are continuous with those of the gum, and with those of the periosteum of the alveolus.

II. Inflammation of the pericementum is either a plastic (formative) or suppurative (destructive) process. These two kinds differ from each other only in degree and intensity.

III. Plastic pericementitis is characterized by the formation of nests of inflammatory elements, arisen from medullary elements which have appeared from the connective tissue after dissolution of its basis-substance.

IV. Plastic pericementitis may terminate in resolution, if the inflammatory elements be not numerous, and the basis-substance be re-established; or it leads to hyperplasia of the connective tissue, if a large number of inflammatory elements have formed and the inflammatory process has repeatedly recurred.

V. Pericementitis in its more intense degrees is always accompanied by cementitis of the root of the tooth, and by osteitis of the wall of the alveolus. Plastic pericementitis leads to a new formation of cementum as well as of bone-exostosis.

VI. Suppurative pericementitis results from the breaking apart of the inflammatory elements which have arisen from the connective tissue of the pericementum itself. Emigrated colorless blood-corpuscles probably share in the formation of pus-corpuscles; but no proof thereof is possible. The main mass of pus-corpuscles is due to a transformation and destruction of the inflamed tissue.

DENTAL PATHOLOGY AND THERAPEUTICS.

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(Continued from vol. xxi. page 235.)

BESIDES the constant and improper irritation which results from unnecessarily painful excavating, from undue haste in endeavors for the extirpation of semi-devitalized pulps, from unduly severe chiseling, filing, and burring, from inappropriate force in the introduction of hand-pressure fillings, and from the long-continued and too violent use of the mallet, it is also requisite that reference should be made to the comparatively frequently peridental trouble (sometimes of

very grave type) which results from oversights in connection with ligatures, rubber tubing, and rubber dam material.

During the introduction of foil, gutta-percha, and phosphate of zinc fillings, it is usually important that moisture be prevented from entering the cavity of decay, or from otherwise interfering during the operation. This is accomplished, more or less perfectly, either by napkins, ligatures (thrown around the necks of the teeth), or by the use of that invaluable adjunct, the rubber dam.

In connection with the use of napkins, it may be well (though not strictly relevant to the subject under discussion) that mention be made of the liability to infliction by *abrading the mucous membrane* if they are too quickly removed, and especially if they have accomplished perfectly the object desired, and in so doing have become but slightly, if at all, moistened.

It should always be remembered to *wet the napkin thoroughly* prior to removal, as this effectually precludes the possibility of wounding the mucous membrane or epithelium of the lips.

But it is through the medium of forgotten or unobserved ligatures, or as the result of leaving small rings of rubber tubing or small pieces of rubber dam, torn off during attempted removal, that the serious cases of periodontitis are invoked.

As preventives to such accidents I have made it a *habit* to leave *long ends* to the ligatures after knotting them, in such wise that they cannot be overlooked. This is particularly important when *more than one* ligature is employed, as is sometimes the case when it is desired to force the gum a little *up* on the neck; also a ligature with long ends should *always* be tied into the ring of rubber tubing before it is slipped over the tooth.

This I regard as particularly worthy of attention, for there is no other irritant of this kind so likely to be left as concealed tubing, and certainly none so likely to cause *serious* inconvenience.

The very *bulk* of the rubber, together with its *proper elasticity*, if good, as it should be, conjointly tend to form a cause for trouble as insidious as it is dangerous.

It is *insidious* from the fact that it obtunds somewhat the sensibility of the parts, by pressure, as it progresses upward, thus, while causing pain, not giving sufficient to warn of its true importance.

It is *dangerous*, because just in proportion to the conical shape of the root of the tooth around which it is left, so does it advance towards the apex, destroying the peridentium as it moves gradually but surely onward *even to the end!*

With all the care which it would naturally be inferred I would give to this point, I have had several cases of trouble from this cause in my own practice, and it was not until I had *formed the habit*

of putting *warning ligatures* upon these tubes that I became exempt from this danger.

I have met with a number of instances in which other operators had been as unfortunate as myself. Some have told me that they had *lost teeth* by the persistent working of these rings, they having accomplished *comparatively painless extraction*.

Profiting by this hint, I have *extracted two teeth* for patients of hemorrhagic diathesis by this method, combating, by local applications, any undue irritation, and rather aiding the work by gently pressing the rings towards the point of their final destination!

Pieces, and even rings, of rubber dam are sometimes left high up under the gum, without even the possibility of a suspicion, on the part of the operator, as to what has occurred.

This is almost invariably due to the fact that the portion has torn from the main piece during the progress of the work of filling, and that it has not been observed even when the ligature which had held it was cut away.

These pieces, or even rings, are much more liable to give trouble rather than to inflict serious mischief. They seem, fortunately, to be possessed only of strength sufficient to annoy, and not sufficient to obtund and destroy.

In the removal of these irritants it should be recognized that they have given rise to markedly increased sensibility of the surrounding parts, *even though they may have partially obtunded the tissue in immediate contiguity with them*, and therefore all manipulations, whether during examinations for the purpose of forming diagnosis, or during operations for the purpose of affording relief, should be conducted with *especial gentleness*.

It should be borne in mind that, like the cornea, gum tissue and peridental tissue are reasonably devoid of sensibility *during normality*, but that their sensitiveness is increased *to a remarkable degree* when inflammation has become pronounced.

An ordinary hoe-excavator—small point—is probably the best instrument which can be employed in these cases, for it is alike efficacious in determining the cause of trouble and in affording the desired relief.

The instrument should be gently, but steadily, inserted under the gum, passed quietly up to, over, and beyond the concealed irritant, and then be used for the removal of either string, tube, or portion of dam.

During the entire progress of this manipulation much relief will be afforded by judicious counter-pressure, and also by a *gentle pressure* of the gum between the thumb and finger.

After the removal of the irritant it is unwise to permit much

rinsing, even though there be considerable hemorrhage; it is far better that the patient merely spit out the blood, and that the prompt and complete formation of coagulum around the root be secured *and not interfered with*.

Local pain obtundents upon the gum are in order if indicated; for this purpose either the occasional application by the patient of *phénol sodique* upon a *piece of muslin*, or of the mixture of *equal parts of laudanum and tincture of aconite* upon a *pellet of cotton*, or the application by the dentist of the *dental tincture of aconite* (the ordinary tincture evaporated to one-fourth of its bulk) by means of cotton, or bibulous paper will be productive of a gratifying result.

IX. *Excess of filling material*.—Under this head I have already given, at sufficient length, that which seemed to me desirable in the governance of practice (DENTAL COSMOS, July, 1878), but I have had, since then, such an amount of prompt announcement of *excess of filling material*, and such satisfaction—indicative of *its exact location*—from the use of the “magic impression paper” (referred to in DENTAL COSMOS, December, 1878), that I am constrained again to recommend its use as one of the neatest and most efficient of all adjuncts in the diagnosis of this condition. It has only to be employed to be thoroughly appreciated.

X. *Inflammation of the pulp*.—Under this head very full remarks have been made, and I have, therefore, at this time, only to call attention to the fact that directions for the *removal of fillings*, when this is indicated in connection with this condition, have been given with sufficient minuteness for all possible demands, under the head of *putrescing pulps* (DENTAL COSMOS, August, 1878).

XI. *Excision of pulp without alleviating hemorrhage, if required*.—Under this head the treatment for this condition has already been given.

XII. *External irritation by forcible withdrawal of pulp*.—The treatment for this unfortunate result of dental manipulation has also been given with sufficient detail, but I deem it important again to ask attention to the fact before stated,—that extreme cases of this untoward complication have resulted in seriously painful and obstinately intractable facial neuralgia, which has only been relieved by combined extraction of the teeth and long-continued, potent after-medication.

Inasmuch as no one can possibly foretell such deplorable results, it is all the more needful that the utmost circumspection should be exercised in regard to this matter, that, so far as may be, no likelihood of such occurrence shall be permitted.

To this end all pulp-work, in the direction of extirpation, must be done with due deliberation, and especially must *traction*, with pulp-hooks or barbed broaches, be made in constant recognition of the

liability to this accident. So far as is consistent with safety, broaching should be done by *rotation* rather than by *traction*, but particularly should this be regarded in the removal of such devitalized pulps as have but recently given peridental trouble through continuity of inflamed tissue.

In the removal of putrescent pulps—thoroughly devitalized—this contingency is not at all apt to arise, but, during the removal of *recently devitalized* pulps, particularly from the teeth of sanguo-lymphatic, nervo-lymphatic, or bilio-lymphatic patients, the easy possibility of this serious complication should ever be present in the mind of the operator.

(To be continued.)

"SECONDARY" DECAY.

BY S. B. PALMER, M.D.S., SYRACUSE, N. Y.

DECAY of teeth has been throughout the history of dentistry a subject of much thought and discussion. Of late the contributions of Magitot, together with the able criticisms thereon, have been laid before the profession. These we will attempt neither to controvert nor transcend. Whatever opinions are held respecting the causes of decay, a remedy for the evil is generally looked for in operative dentistry, which aims to arrest decay, and, if necessary, to restore the portions lost. Operations to this end are considered only as mechanical. A high order of skill and a suitable preparation of the gold are deemed sufficient for tooth-preservation, the claim being that "failure in operations is mainly due to defective manipulation." If this be true, dentistry has reached its climax. Bound by this teaching and limited to this practice, we are compelled to witness failures of our own and others, for which there seems to be no remedy. May it not be possible that there is yet something to be learned respecting the true causes of that decay around fillings which we will denominate *secondary* decay?

It is claimed that the same influences which cause primary decay continue when not arrested by filling, and that the filling material has no special agency in the matter. It seems almost useless to enter into argument upon these points, as they are so little understood. We ask the reader who, like ourselves, would do better work and have fewer failures, to consider this subject with us. We have no desire to provoke controversy. If there is any good to come out of the electro-chemical theory, the most devoted advocate of gold will probably receive the greatest share. I am confident that the per-

sistent opposition to this theory from this class of operators comes from misunderstanding it. We affirm that success or failure in dental operations is governed by natural laws, and we earnestly invite the aid of the profession in discovering these laws, so that operative dentistry may rest upon a scientific basis.

Whatever may be our conclusions respecting primary decay, based on study of the subject, we accept *in part* the statement that "teeth, after having been filled, are subject to the same influences and destructive agents as formerly, and nothing more." This "*nothing more*" is the point of contention. We believe that all filling materials are good when inserted in a manner to exclude *external* fluids from cavities in teeth of *fair density*; also, that fillings in frail teeth are injurious in proportion as the material is a conductor; beneficial in proportion as it is a non-conductor.

Without considering any of the chemical causes of decay, we assume that moisture is a natural element in every living tooth. The difference between a tooth recently extracted and one perfectly dry may serve as an illustration. This aqueous element is the medium, so to speak, through which the commerce of tooth-building is carried on. To distinguish this element from external solutions to which teeth are exposed, let us call it the vital fluid. We need only mention that the structure and density of teeth greatly depend upon the nature and activity of this vital element. Take, for illustration, a well-developed adult tooth. It contains more of the mineral elements which give it density, and less of the aqueous and organic elements usually found in younger specimens. This class of teeth may be safely filled with gold, and, when properly done, the claim that gold will preserve teeth thirty, forty, or fifty years is well founded, and the writer has never taught that gold in such teeth exerts an injurious influence.

Anticipating to some extent the opposition we are contending with, we have been particular from first to last to place gold *first* as a filling material, and to use it when it seemed desirable and consistent with the preservation of the teeth. This fact has been lost sight of by those who oppose the electro-chemical theory.

Believing that a correct comprehension of the principles relating to filling teeth will best qualify the operator for his duties, we invite a consideration of the rudiments of this much-abused theory. It is conceded that a large proportion of teeth are so dense, or, in other words, are so non-conductive of thermal changes or electro-thermal currents that gold, properly inserted, is sufficient for their preservation. *In proportion as teeth fall below the average in density will be the degree of failures with gold*, though the greater the skill the better will be the results. If, however, we undertake to make permanent fillings

with gold in teeth in which the animal elements predominate over the mineral, we simply invite failure.

Let us consider a class of teeth with which we are quite familiar, teeth of young patients so poorly calcified as to need treatment at an early age, or teeth with devitalized pulps of like defective structure wherever found. It is well known that such teeth contain an excess of what we called vital fluid or moisture. This fluid element, being of the same nature as the solid constituents, has no power to act upon the latter, and cannot cause decay or dissolution until the equilibrium is disturbed. Teeth are moist at all times; the pulp contains moisture, and yet teeth do not decay from within, nor yet from without, except when the external fluid in some fissure, pit, or cavity is rendered chemically different from the fluids to which other surfaces of the teeth are exposed.

For explanation, a cavity filled with gutta-percha does not keep the walls dry, yet such a filling may be used to displace the fluids without the use of absorbents and still arrest decay, because the remaining moisture is neutral, or becomes neutral by contact with the vital fluid,—a condition in which the tooth is no more liable to decay than it is from the moisture in the pulp-cavity. This material is compatible with the dentine. Under the cover of such protection the external decay-producing influences common to every metallic filling in use are inoperative. Nature is not interrupted through the vital fluid in the work of calcifying and strengthening the structure, the process not being disturbed by external excitants, such as thermal changes, electric currents, or decomposing fluids.

Now let us study the influences set in action by gold, tin, and amalgam. Bear in mind that this applies to teeth in which gold would be likely to fail in a short time, and to cavities so out of reach as to render the operation questionable with gold alone.

Without specifying the more complex influences which render metallic fillings incompatible with dentine under the circumstances last mentioned, I will state that *conductivity of the filling is the one general cause of secondary decay*. Fillings affect the teeth in proportion as the metals are good or bad conductors of thermal or statical electricity. It has already been stated that moisture beneath a non-conducting filling, as gutta-percha or oxychloride of zinc, remains inactive; likewise pulps protected by natural caps of the decalcified or cartilaginous portions of dentine are less liable to become irritated. *All external influences being removed from softened dentine, it is possible for nature to recalcify such portions as remain sensitive or have not become disorganized.*

The practical questions of most interest to us are these: What pernicious influence does a gold or tin filling exert which a filling of

a non-conducting material does not? and, What is the difference between gold and tin? We leave amalgam out, because this communication is not intended to provoke discussion upon the relative merits of filling materials, but to determine the influences which such materials exert upon teeth. We claim, first, that decay is the consequence of the action of moisture; second, that this action is accelerated by conductive fillings. The ordinary process of decay is simply a chemical union of the mineral constituents of the tooth with elements contained in the fluids to which it is exposed. It is generally conceded that acid fluids are more active in dissolving the lime-salts found in the teeth, yet the oral acids are usually exceedingly weak, and, consequently, months and years may be required to destroy a tooth even where decay has commenced.

Perfect exclusion of such fluids is complete arrestation of decay; *imperfect* exclusion is partial arrest when the filling is a *non-conductor*; but when the filling is a *conductor*, the action of decay is facilitated. I wish to be clearly understood upon this point. What we accept as facts concerning the power and agency of the electric current in influencing secondary decay has been misunderstood and misrepresented. We are told that dentine or bone is a non-conductor of the electric current, and could only be acted upon by a powerful battery; that no such battery is ever constructed in the oral cavity; and, finally, that electricity has nothing to do in promoting decay. These assertions are partly true and partly false. The apparent and well-established facts are introduced to those who have not made electro-chemistry a study, as evidence that the minor currents, if such exist, exert no influence to produce decay, when the fact is that the current and its action, strong or weak, differ only in degree. We have already stated that the acid found in a cavity is exceedingly weak,—so weak sometimes, that years *may be* required to destroy a tooth; this every observer understands. The electric current from feeble chemical action is correspondingly weak in its influence. Chemical action and the electric current are inseparable, the latter being a force or molecular disturbance thrown off from the former, the chemical action preceding the current. This is as far as the ordinary critic seems to travel in search of facts. Notwithstanding what has been said to the contrary, we have found in all the experiments we have made, whether in or out of the mouth, that the law of chemical action obtains as certainly as the law of gravitation.

Since our theory has been disputed, we wish to illustrate three other points: first, the action of gold; second, that of metals which oxidize; and, third, that of gutta-percha. Great injury has been done in this direction by a few writers who are accepted as authority in chemistry and kindred branches,—men at whose feet I would gladly

sit for instruction on all points except this one, viz., electro-chemistry as applied to operative dentistry.

For some time past I have been searching for the cause of difference of opinion between that as found in the text-books and promulgated by teachers and that held by those who believe in the electro-chemical theory. Possibly it is because they and we have studied such different expressions of the working of the same law. The observation of various batteries and of their solutions, of chemical action and its relation to the electric current, supports me in my position, and the facts thus obtained are substantiated in my practice. We have stated that a tooth, if below the average structure or density, becomes a battery when filled with metal as a conductor. This statement is denied, but mere opinion without knowledge amounts to nothing. In what respect, then, may the action between a tooth and a filling be compared to a battery?

The description of a single cell of a battery which I constructed for a reserve, to be used while others were being cleaned, will best illustrate the analogy. The two elements are copper and zinc, and were put up in the form known as the "gravity battery,"—sulphate of copper solution below and sulphate of zinc solution above. To prevent local action when the circuit was open, a disk of plaster, about one inch thick, was introduced half-way up the jar. This was pierced with a small opening to allow the gas which accumulated below to pass off. The zinc element, instead of being suspended, was placed upon the plaster. This cell has now been in working order three years, with no cleaning or change except the addition of water when needed to supply the evaporation. The copper solution is still "saturated," as the crystals have not all dissolved, which would have been the case had there been much local action. Modifications of this form of battery are in use with felt or other disks, or with tubes through which to feed the negative solution, but none answer the purpose of an explanation like the one described.

Now let us see what occurs,—what is the chemical action of this cell. The explanation given of the *usual* working of this battery is as follows, and is doubtless correct: "The sulphuric acid and oxygen of the sulphate of zinc are transmitted to the zinc, combine with it, and form fresh sulphate of zinc; the sulphuric acid and oxygen of the sulphate of copper are transmitted to the zinc set free by the above process and reconvert it into sulphate of zinc; the copper of the sulphate of copper electrode is transmitted to the negative electrode, and remains adhering to it. Sulphuric acid and oxygen have a greater affinity for zinc than for copper, otherwise there would be no source of power in the substitution." This description is taken from Jenkins's "Electricity and Magnetism," and teaches the common

theory that chemical action precedes the electric current. This is true of the battery alluded to in usual working order, but it is liable to difference sufficient to lead to grave misunderstandings. In the battery under consideration the two fluids are separated. The copper or negative electrode is in a saturated solution of sulphate of copper. The zinc is also in a saturated solution of sulphate of zinc. So slight has been the local action, including the use of the battery repeatedly, that a light charge of sulphate of copper has not yet been decomposed. The two poles are charged, no doubt, from chemical action during the long intervals of open circuit, during which time the consumption of zinc is imperceptible. On closing the circuit the usual chemical action of a battery commences at the expense of the elements. In this action we find a condition not considered by any who have attempted to overthrow our theory. The fact is, we have zinc quietly remaining in a solution incapable of action without the means of exchange of electricity. *By supplying such means* the relations between the fluid and zinc are at once changed; chemical action and consumption are the result. It has often been stated that only a strong current of electricity could decompose the fluid beneath a filling; that no such current is ever produced in the oral cavity; and that the claim that it is is without foundation. It is well known that the oral secretions, though normally in harmony with dentine, are unstable; when confined in fissures and cavities in the usual way, fermentation and decomposition are sufficient to disturb the relations necessary for preservation; the addition of any conducting material increases such action according to an established law; the *constancy* of the action is determined by the same principle that is manifested in other batteries, viz., the electrical difference between the two elements, together with the *degree* to which such differences are maintained. The usual argument in favor of gold, because "it has and may preserve teeth forty years," proves nothing in this case. Such cases are outside of the principles we would establish,—are, indeed, even more outside of the charges brought against gold. *This is granted.* Let us meet this question fairly and intelligently. We have seen most beautiful misplaced gold fillings fail in two or three years. I would not say that such operations were "worse than no fillings," from the fact that teeth so frail as to lose a properly-inserted filling in that time would, perhaps, be lost sooner without it. The filling for a time would be a protection, and better than nothing, but the time arrives in such cases when the scale is turned and decay is hastened by the presence of a negative conductor, when a non-conducting material would allow the moisture beneath it to remain the same as that found in fissures and small cavities corresponding to the size of the space between the filling and the dentine,

and decay would be slow in action. It is *at this point* where the "tarnish" (probably carbonates or sulphurets) from tin and amalgam comes in, with its antiseptic properties, to lessen the conductivity of the filling and to fill the dentinal tubuli with an insoluble compound. In other words, *the negative element, in substance, passes over and into the positive until the two become electrically nearer, and consequently the action between the two proportionately less.* Thus we have set forth what we believe to be the additional influences which cause "secondary" decay.

HOW TO KEEP TEETH CLEAN AND HEALTHFUL.

BY GEORGE A. MILLS, BROOKLYN, N. Y.

(Read before the First District Dental Society of New York, November 4, 1879.)

(Continued from page 675, vol. xxi.)

OF no one thing am I more assured than of the truth of the adage, "What is worth doing at all is worth doing well." In my previous article I emphasized the importance of clean teeth and a healthy mouth, but these secured cannot be retained except by faithful and intelligent care, on the part of both the patient and the dentist. It requires the co-operation of both to secure health and comfort. I maintain that there is a very great lack of understanding on the part of dentists of what to do, or of what to teach the patient to do to secure a success at all commensurate with the outlay of time, money, and energy; or a want of rectitude on the part of one or the other. A great variety of motives stimulates to the minimum or the maximum of exertion, and the results are in proportion to the efforts.

How to keep teeth clean involves the consideration of how to keep them healthful. I have a large amount of testimony settling the fact to my satisfaction that a majority of dentists have not the ability to meet the requirements laid down in my previous article.

As I am not aware of anything practically new in the way of dentifrices, I can only allude to them as auxiliaries or assistants in promoting cleanliness, and in neutralizing the abnormal acidity so commonly present in the oral cavity. No one has yet discovered the magic prophylactic, notwithstanding the absurd claims of the venders of various nostrums, such as "Sozodont." Of this article I will testify to what is also well known by most dentists, viz., that it destroys the color of the teeth, turning them to a decidedly dark yellow. There is, of course, quite a general use of tooth-brushes by the people, but not uncommonly an abuse of them for want of proper instruction. It is getting to be better understood by both dentists and patients now than formerly that a crosswise brushing is not wise, but that

the upper teeth should be brushed downward, and the lower teeth upward. It is a common mistake not to brush thoroughly the buccal and posterior surfaces of the third molars, and the lingual surfaces of the lower front teeth. I am sure that nothing like an adequate amount of care is given to this preventive service. It cannot be too strongly impressed on the minds of the guardians of children that they should see that the practice of brushing the teeth thoroughly is begun as early as possible, so that it shall become a habit to be continued through life.

Concerning the forms of brushes, I will say that straight brushes are utterly impracticable on the surfaces to which I have referred as the ones most neglected. Curved brushes with a tuft end, bud-shaped or convex, are the best. There are several favored forms that are quite efficient in the line I have spoken of. One of these, named the "Windsor," I have faithfully tried for twenty months past, and introduced it very generally in my practice, and I feel that it meets the indications better than any other within my knowledge. The faithful use of floss-silk between the teeth ought to be earnestly recommended; also the *quill* toothpick. The wood toothpicks so generally furnished at public eating-places are a source of much evil to the soft tissues between the teeth. All kinds of metallic toothpicks are objectionable, though I am aware that it is the practice of some dentists to commend them to their patients.

The value of a decided polished surface of the tooth becomes very apparent to those who have had the operation performed; the facility with which such teeth can be kept clean is evident; and although this condition may have been secured at considerable expense, yet it is an investment that will pay a good rate of interest. I do not think many dentists have much idea of the beautiful polish that a human tooth will take. Many teeth are capable of a great improvement in this direction which are now a decided detriment to what might otherwise be a pleasing face. We know that the general idea among the people is, that interfering with the surfaces of the teeth destroys the enamel, but we also know that this is a popular error.

I have heretofore written regarding the cleaning of teeth as a necessary method of examination; a matter which, so far as my observation extends, has had but little attention,—certainly not attention commensurate with its importance. I refer to the very general indifference as regards thoroughness in filling. We have at our command appliances and materials to enable us to produce more uniformly good results.

Because one can make a really good filling he is not, therefore, a *competent* dentist in the broad signification of the term. A great many operators fail to put the mouths intrusted to their care in

thorough order before the case is dismissed. It is very common for dentists to fill a few cavities, and call attention to others, often in a very indifferent manner, by saying, "These will need attention in a few weeks, or perhaps months; but they are not yet decayed enough," etc. If this subject is introduced in conversation among dentists, such a course is defended, on the ground that "patients are not yet educated to having the teeth attended to thoroughly, and would not be willing to pay the bills which such care would make necessary, and we do not propose to educate them at our expense," etc. I am well aware that these statements bear upon the question of *duty*, and belong to what we might call the humanitarianism of our calling. How can the people know the value of this thoroughness without it is put into practice? It is to the incoming generation of dentists we must look for a more general application of this practice. I think that it will be comparatively easy for them, for it seems to me that we are gradually emerging from the influence of that commercial aspect of dentistry which has so seriously retarded our progress in the past.

My allusion to thoroughness in filling has a very important bearing upon the general subject of this article. Providing that the teeth are cleaned, polished, and made healthful in their surroundings, what will it profit if the disintegrated or missing portions of tissue are not replaced by some material which will prevent the lodgment and decomposition of foreign matters in the cavities? Let patients be never so zealous in the care of the external surfaces of the teeth, they cannot reach these vulnerable localities with brushes or dentifrices. Some practitioners contend that the duty of the dentist to himself does not demand of him to perform all the service needed without first securing the consent of the patient. Conceding so much for the sake of the argument, what shall be said of these same practitioners when they do not even call attention to, or advise the patient to have all done that is necessary in the interest of personal comfort, cleanliness, salvation of the teeth, and even of economy? Some declare that they have no simple cavities to fill, but they wait, and let decay proceed until the cavity is of suitable size, according to their judgment. Such statements are not made by patients alone, but are declared openly by practitioners, and even by those having a large and respectable *clientèle*.

Artificial appliances of unsuitable materials and badly constructed are also a prolific source of oral disease, and necessarily a direct hindrance to keeping the teeth clean. I believe all bases made of vegetable material are decidedly injurious to the tissues of the mouth, partially on account of their non-conducting power, and also because they absorb the secretions of the mouth. They are, therefore, vastly inferior to bases made of metals, or mineral substances, when prop-

erly constructed. I think a large majority of the best members of our profession agree with me in this opinion.

Not long ago, in my office, a very handsome and cultivated lady took from her mouth a large palatal plate of celluloid, with one single bicuspid attached to it; the plate was slippery and disgustingly offensive. Handing it to me, she said, "Is that the best production the dental profession can give me to replace my lost tooth?" (The only one absent.) "I cannot keep it in any better condition, however great the care I take of it." This had not been placed in her mouth by a so-called "quack," but by a professor of operative dentistry in a dental college.

This whole subject is one of great importance, and in all its relations demands our earnest consideration. Just here I will introduce to your notice with hearty commendation an instrument made by Dr. Clowes, called an explorer. If we fill all cavities we can detect with that instrument, and remove all deposits we can feel with it, I think we will surely be on the road to thoroughness in dental operations.

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR meeting of the society, held at the residence of Dr. W. A. Bronson, Tuesday evening, October 21, 1879.

President, Dr. A. L. Northrop, in the chair.

INCIDENTS OF PRACTICE.

Dr. C. E. Francis. I have here a cast representing a case of irregularity which has troubled me very much. The lower jaw does not look as if it were well developed, yet I think it is. The upper teeth are very much crowded indeed, and, as you see, the incisors protrude some distance beyond those of the lower jaw. I will pass the cast around, and would like an expression of opinion in regard to the case.

A little child about seven years of age, who recently came from California, was brought to me the other day. She had been in the hands of a dentist who adopts the practice of some of our old-time practitioners, viz., to extract two temporary teeth to make room for a permanent tooth to erupt. I noticed that on one side of her mouth several temporary lower teeth had been extracted prematurely, the result of which is a lack of development, or contracted condition of that side of the jaw, and I can see no chance whatever for their permanent successors to find room enough. I think it is a great mistake to extract deciduous teeth prematurely.

Dr. J. S. Latimer. Is it not possible, in the recent case of pus-poisoning,—I refer to the Gardiner case,—that a broach may have been passed through the end of the root, and, with the sanies or pus on it, punctured the parts beyond, and thus poisoning have been accomplished? It is a question of some importance, for if it is possible in any case, it is worthy of our consideration.

Dr. W. H. Atkinson. "Pus-poisoning" is simply a misnomer dependent upon a misapprehension of nomenclature. The old books make no difference between *sanies*, *pus*, and *mucus*; they use those terms without any distinction. The only theory that recommends itself to my judgment is that advanced by Dr. Waters, viz., that the individual who opened the abscess was in the habit of dissecting, and had probably used an unclean instrument, inoculating Mr. Gardiner with the septic poison. *Arsenicum*, as such, cannot act upon the human body at all. It has to be combined with oxygen so as to become a compound molecular mass. It is arsenious acid that produces the deleterious effects, when they are deleterious. How does arsenic act upon the human body or the animal body? It can act in three ways, and that is a dry truism to the men who have no knowledge about it. It acts either as food, as poison, or as remedy. These are the three possible modes of its action. Whenever it is brought in contact with the protoplasmic part of the tissue, it coagulates the albumen and is self-limiting, with the single exception of the degree of solubility that arsenious acid undergoes in the juices of the flesh; the chemical formulæ of which I cannot now give you, but it is infinitesimal in proportion, and it can act only as a tonic.

Now about the case presented by Dr. Francis. There is no kind of opportunity for two opinions about it. Men who do not know the morphology will tell you to extract teeth—probably the two first bicuspids, maybe they would have the grace to say the sixth-year molars, were they badly decayed. They must take some teeth out! Now, a morphologist (a competent dentist—that is what I mean) would not go off at half-cock and give an opinion upon that cast alone.

Dr. C. D. Cook. Will Dr. Atkinson relate to us a few of the experiments he has made which determine the effect of arsenic upon the animal system, that we may know upon what he bases the statements he has been making here this evening?

Dr. Atkinson. I have learned this, that in using arsenious acid, by laying it upon the skin of a frog, there is in that creature a capacity of taking up poisonous doses of it. All you who have read the journals and know anything of the literature of dentistry will recollect that Dr. J. D. White used to apply arsenious acid around the roots of teeth he wished to extract, until the gums sloughed and the

teeth loosened, so that they could be removed without much force, and we have no report of any injury coming to the patients from his practice. That is a fact, whether it is scientific or not, and we may make our deductions as we please. I don't know that it is profitable to pursue this subject further than simply to say this much, try it for yourselves. I have tried it on a variety of animals, more particularly upon batrachians, and I have tried it upon the human body for extirpating tumors, and for destroying pulps, for which God forgive me; but you will bear me earnest, honest testimony that for the last fifteen years I have spoken against it and advised it to be kept entirely out of our code of remedies.

Dr. Frank Abbott. I have listened with a great deal of interest to Dr. Atkinson's remarks. He makes the positive statement that arsenic can be absorbed into the human body sufficiently to produce a tonic effect only. I have not the documents with me, but there are cases on record where arsenic, by simply being rubbed upon the surface, has produced excessive nausea and diarrhœal effects, resulting in death of the patient. Whether the symptoms and death may be attributed to anything else I know not, but the physician who attended one of the cases is very positive as to the arsenical poisoning. I did not express any opinion about the Gardiner case at all until I had learned of certain symptoms in his case from the reporter himself. Then I said, "From what I learn from you I judge that the man died from the effects of an alveolar abscess; and, in my opinion, if he had remained in Dr. Marvin's charge, as he ought to have done, and allowed him to treat him, as he could and would have done, he would be living to-day." I am now as thoroughly convinced in regard to the man's death and of what he died as I can be of anything.

Dr. Atkinson. Let us have it.

Dr. Abbott. Septicæmia (blood poisoning). That expression was published in the first issue of the *Times* in which this case was "written up." That the man died of blood-poisoning I think will hardly be questioned. Where did it come from? That is the question. Several gentlemen have suggested that possibly he might have been inoculated with poison upon the knives used in the numerous operations said to have been performed upon him. It may be accounted for without that, I think. Why, the man's face was poulticed three or four days, until it was swollen out upon the shoulder. There was pus and putrid fluid enough in the sac, I presume, to have filled a quart measure. Is it at all wonderful that this pus and putrid blood should have been absorbed sufficiently to produce death? I knew a man who died from sticking a pin in his toe. I watched him night and day and saw him die.

Dr. N. W. Kingsley. The cast of irregular teeth referred to by Dr.

Atkinson was shown to me before the meeting, and I was asked for an opinion. I did not answer at the time, but will do so now. The case suggests to me two points that it seems are constantly overlooked by dentists in forming an opinion in relation to regulating. I have spoken of it repeatedly, but it seems that I am obliged frequently to reiterate the statement. One point is this, I cannot, and I doubt if any of you can, form a definite opinion, except in rare cases, from a view of the model alone, even if it is a good model. It is essential before coming to a conclusion to have the model in your hand and the face before you, that you may form an opinion of the jaws in their relations to the external features, as well as the relation of one jaw to the other. It is not safe in any difficult case to decide definitely upon a course of treatment from a study of the models alone. Of this case, one gentleman said that it is like one in which I had advised the extraction of the lateral incisors of the upper jaw. I have advised, under certain circumstances, the extraction of the superior laterals, but the cases were widely different from this; and such cases and this one have nothing in common. So far as I can judge from the cast without seeing the patient's face, this is a pinched jaw with mal-occlusion, resulting from a narrow superior arch; the lower teeth shut behind their normal antagonists, in some places a whole tooth behind their proper place. The remedy lies, in the first place, in widening the superior arch and bringing forward the lower teeth to their proper places; and I do not believe, without seeing the face before me, that such a change of relations would be out of harmony with the face. This course I have pursued frequently, and have called it "jumping the bite." If upon widening the upper jaw the lower teeth do not shut forward into their true places, they must be made to do so by fixtures. It seems to me there is no other possible course to pursue if we wish to pursue the best course. The extraction of laterals or any tooth would make it worse. If we inquire into the original cause of this deformity, we shall find ourselves in a maze, and probably never would arrive at the initial. It is not necessary for our present purpose that we should, but one of the secondary causes is, that for some reason or other the bicuspid teeth came within the true dental line when they erupted, and the lower jaw being of nearly its full width, was forced back in order to find an articulation. Widen the upper jaw and let the lower jaw come forwards, and the deformity is corrected.

Dr. C. A. Marvin. I have said and written so much about the Gardiner case that I feel as if I should be only wearying your ears by answering your call to speak upon it to-night.

The history of my connection with the case is short and will occupy but little time in recital. The knowledge of it which I gained from

other lips, and my opinion concerning it, with the reasons for that opinion, all of which, I presume, you desire to know, will require a longer time to present. I shall condense the statement as much as possible.

My personal knowledge of the case was gained from a brief examination in an interview of about four minutes' duration. The gentleman presented himself one morning,—September 12,—saying that he had an aching tooth. It was a right lower molar. He said his dentist in Boston had been treating it; that he was obliged to come to New York; that it had pained him all night, and he would like to have me look at it. I did so, and found a large compound cavity, embracing a portion of the grinding surface and nearly the entire length of the anterior proximate surface, filled with some dark substance. The tooth was sore to the touch, the gum on the outside of the alveolar ridge slightly swollen. I judged it to be a case of irritation produced by premature closure of the pulp-cavity, with indications of periostitis if not relieved. I removed the temporary plug, which was cork over cotton or bibulous paper soaked in some preparation like vaseline, cleansed the cavity, and applied creasote on cotton, very loosely put in, advised him to return to his dentist (which he had already spoken of doing), and let him continue the treatment at once, and dismissed him.

There was nothing alarming, nothing even serious in the appearance of the tooth or the gum at that time. The slight enlargement on the buccal side of the alveolar ridge was well down opposite the roots of the tooth, was not at all angry in appearance, answered to the touch with no pus-indicating fluctuation; indeed, had no peculiar characteristics about it whatever. The edges of the gum around the neck of the tooth were firmly connected therewith, were not at all abraded or cauterized or swollen. The cavity opened into the anterior root-canal, but I am not certain as to the posterior. I did not explore the canals thoroughly for two reasons: I had not the time, and I did not wish to stir up a fresh irritation which might be difficult to allay.

So much for my personal knowledge of the case. On Thursday, September 25, nearly two weeks after I had seen Mr. Gardiner, his physician called upon me, inquired what treatment I had employed, what I thought had been employed previously, and said he considered it a case of arsenical poisoning. He then described to me such symptoms as were most marked and which he considered indicative of poisoning by arsenic. The detailed symptoms failed to bring me to the same conclusion, but gave me at once a very clear and positive opinion of the case; I saw at once that he was describing a very severe case of alveolar abscess, and the conversation then turned to the sub-

ject of his treatment, when I perceived a decided variation from what I deemed essential when such cases were in my hands. I asked the doctor if he did not think there was some constitutional taint about the patient. The reply was a suspicion or belief that there was a tendency to insanity in the family. This answer not touching the idea that prompted my question, further conversation in this direction ceased. A conditional promise to visit the gentleman in company with the physician being impossible of fulfillment, I neither saw nor heard anything further, if I except the statement of the doctor later in the same day, that "his patient was better." Hearing this, I replied, "I am very glad; and now, if you have a thorough opening to the seat of the disease, so that you can cleanse it and readily apply your remedies, I trust you have control of the case."

The next I heard of it was when I read the extraordinary statement in the *Times* of October 6, purporting to be an exact reproduction of the language of the two gentlemen visited by the reporter, viz., Dr. Guy and Mr. A. C. Lewis.

It will be instantly conceded by every one familiar with cases of arsenical poisoning, that in the symptoms given as characterizing this case those always seen in connection with cases of poisoning by arsenic were conspicuously wanting, while those attendant upon alveolar abscess were unmistakably present. It will be admitted, also, that the extreme and unnatural malignancy manifested here must have been owing to some constitutional predisposition, because abscesses of this kind are not necessarily, not frequently—indeed, are rarely—fatal. In the most extreme cases they do sometimes occasion the loss of part of the maxillary bone, but this is the result usually of neglect, or of the aid given by a scrofulous diathesis, or of syphilitic poison. But even then the acute affection is deemed susceptible of treatment and possible of cure. It is known, also, that by no possibility could the minute portion of arsenic used to devitalize a dental pulp, produce so appalling a result, even if it should escape from the cavity. The most it could do would be to destroy the fibrous connection of the gum with the neck of the tooth, and the septum of bone between the roots of adjacent teeth, necessitating its removal. Its effect would be local and limited, not constitutional.

But the arsenic theory was most effectually put to flight when Dr. Waters, in a long article detailing his treatment, positively denied using any. And when the condition of the tooth, as Dr. Waters described it, is considered, it will be at once known that he used no arsenic. The case did not call for it. If, then, he inserted none, I cannot quite see how I could have liberated any.

There are some questions which somebody ought to be compelled to answer. It ought to be known whether the failure to summon med-

ical aid for five days was at Mr. Gardiner's request, or whether the care of the case was assumed for that period by some one unqualified by education and not entitled by law to take such a responsibility. It ought to be known what treatment, if any, constitutional or surgical, was administered during that period.

It was asserted that some chemist had analyzed some of the sloughed parts and found arsenic. It ought to be known who he was and what were his tests.

The story was a very sensational one, founded on the mysterious death of an unfortunate man. It cast unjust reflections upon innocent men, and aspersions upon a useful profession. It is a pity that the columns which widely circulated the original story should have been closed to the repeated contradictions from the pens of eminent gentlemen whose names were dragged before the public.

The conclusion of this whole matter may be summed up briefly as follows:

The case was neglected in its first stages, when vigorous treatment was indispensable to a cure.

An alveolar abscess was formed and held sway unchecked, growing more and more malignant daily.

Some constitutional predisposition prepared the way for the unnaturally rapid spread of the malady, and caused it to assume a vicious character.

The real nature of the disease was not understood by the physician, and the benefit which appropriate treatment might have produced was consequently lost.

The charge of arsenical poisoning was altogether without foundation, and cast an undeserved reflection upon our profession.

Dr. W. H. Dwinelle. Following what may have been said, I take this opportunity to say a few words. I deduce from what I have heard since I have been in the house that the matter of the recent so-called arsenic-poisoning in the Gardiner case has been discussed here to-night. I infer that it has been assumed on the part of some here that arsenical poisoning, in the case referred to, took place, and that the practice of using arsenic in the profession has been condemned altogether. I believe my friend Atkinson condemns it utterly and entirely. I never heard a good reason why he did so. Of course, after the discussion, from what I heard to-night, none of us believe that Mr. Gardiner died from the effects of arsenic, especially as it is conceded on all hands that no arsenic was used. There are probably forty reasons why he did not die from the effects of arsenic, but this one is quite sufficient, so I will not repeat the thirty-nine remaining. I was in the country at the time I heard of it, and saw some very startling announcements in the papers,—one a telegraphic dispatch

to the *Syracuse Herald* that Mr. Gardiner's head was nearly severed from his body by decay, caused by arsenic placed in one of his teeth. I understand some very extravagant expressions have been made tonight against the use of arsenic. I stand here to defend the use of arsenic in our profession. (Applause.) I believe it to be just as useful and safe a remedy as we have in the store-house of our too limited remedies. (Applause.) I believe it to be one of the most harmless and useful remedies in our profession. I do not believe any injury ever comes from a proper use of arsenic in the hands of any man of common sense in our profession. I do not stand here to arrogate to myself superior ability in the profession. I only profess to have done my best, carefully, thoroughly, and conscientiously. I have used arsenic carefully, skillfully so far as in me lay, for more than forty years. I never had a single instance of any trouble, of accident, or of anything to be deplored or regretted in its use during that time. (Applause.) I do not believe it necessary there should be. I never heard a good reason why arsenic should not be used in the profession, and while I fearlessly stand here to advocate its use, I challenge anybody to give a rational objection or valid reason against its use. I do not believe it can be done. I have heard plenty of *words* and blatant nonsense leveled against it, but never an objection founded in reason. It is and has been used almost universally in our profession. It is used by the best, the most skillful and conscientious in our calling. If used properly no bad use could come of it; indeed, it would require an unusual amount of stupidity to produce any very serious result. The quantity used is so small that were the whole of it to find its way into the stomach it never would be perceptible. Arsenic, as everybody knows, must be taken in comparative quantity to be potent or dangerous to the system at large. When taken by habitual arsenic-eaters for pleasure, to beautify the complexion, to give brilliancy to the eyes, or for adipose, the quantity which the system may be made to entertain is very remarkable,—enough to kill several novices!

We are to be governed by our experience, and the fool of all fools is said to be the fool that will not profit by his own experience; and the converse of that is true, the wise man becomes a fool the moment he refuses to be governed by his own wisdom gathered from his own experience. Permit me to read an able article from the pen of our friend, Dr. R. McGregor, to the *Rochester Union and Advertiser* of October 9:

“THE CASE OF MR. GEORGE ARTHUR GARDINER.

“TO THE EDITOR OF THE UNION:

“*Sir*,—It is not the purpose of your contributor to comment on the case of Mr. Gardiner, the circumstances of whose horrible death were related with

sickening details in the *New York Times* of the 6th, and reproduced on the first page of the *Union* yesterday. But he has a word of comment to offer on a single declaration by Mr. A. C. Lewis, who constantly attended Mr. Gardiner during his confinement. Mr. Lewis said, 'There cannot be a doubt that Mr. Gardiner died from the effects of arsenic, placed by a dentist in his tooth to kill the nerve. I didn't know before that the use of arsenic was so common among dentists. They nearly all use it. *They ought to be compelled to quit using it altogether.*' Mr. Lewis is an advanced medical student, and ought to have been better informed, but his ignorance possibly was no greater than that of the mass of respectable physicians about dental practice, its difficulties, and methods and means for overcoming them. It was Mr. Lewis's conviction, then, that dentists should be compelled to stop using arsenic. Your contributor trusts he will presently show that by the same unreason physicians should discontinue the use of Fowler's solution, and all virulent poisons, in the treatment of disease. If any one wishes to know what is the bulk of one grain of arsenic, let me answer that it will cover a quarter of an inch square if flattened down to the thickness of an old-fashioned letter wafer. From the one-eightieth to the one-sixtieth of one grain is sufficient for any single application to the nerve of a tooth, when properly sealed in the cavity; and the bulk is about what would lodge on the head of a small pin, or the extreme point of a penknife blade. Fowler's solution contains four grains of arsenic in each fluidounce. The dose of the solution varies from three minims to fifteen minims; the largest dose, therefore, contains one-eighth of a grain of arsenic. The smallest dose of Fowler's solution contains more arsenic, by about one-third, than the largest quantity that should ever be applied at one time to the nerve of a tooth. "R. McG.

"ALBION, October 8."

I would go farther than Dr. McGregor and state that as the arsenical paste we use is composed of equal parts of arsenic, morphia, and creasote, the quantity of arsenic actually used is less than half of what he states. But even that is not a fair statement. It is assuming that both quantities of arsenic are taken in the system absolutely, which they are not. One is put in the shape of a solution; the other in that of a powder, which is literally boxed up and sealed so that it can only operate upon a small portion of the animal economy for a specified effect as we understand it. I recollect Dr. Westcott stating once that large quantities of arsenic, comparatively, if sealed up hermetically within the center and body of the tooth, could remain there for months with impunity. I think there may be a great deal of truth in it, though we do not usually allow an application of arsenic to remain in a tooth over forty-eight hours. To have produced the effect as claimed in the Gardiner case it would have to be applied locally and externally, and in quantity, working its way by absorption and as an escharotic until it has destroyed membranes, tissues, and bones to "the dropping off of his head!"

Of course we understand that in using arsenic it should be properly applied and secured in its place. The interior of the cavity should be made thoroughly dry, the small quantity of the arsenical paste

should be placed directly, if possible, upon the exposed nerve; it should be practically capped or bridged over so that the pressure of the hermetical sealing will not reach the nerve, and then if the cavity treated is near the gums, they should be thoroughly washed off with a syringe to avoid cauterization from any possible exudation from the cavity while sealing it.

The smallest actual fatal dose of arsenic, according to Dr. Christison, was two and one-half grains in solution.

Dr. Alfred Taylor says from two to three grains may be regarded as a fatal dose.

The *London Medical and Surgical Journal* gives the case of a Tyrolese peasant who took daily in his food ten (10) grains of arsenious acid without injury; the only qualification in the case being that he had previously been in the habit of using opium and other stimulants.

Dr. Pereira, in his "Elements of Materia Medica," says arsenious acid may be administered, in substance, in doses of one-sixteenth to one-eighth of a grain.

Dr. Ireland, in *British Medico-Chirurgical Transactions*, recommends it as a tonic in small doses of from one-thirtieth to one-fifteenth of a grain, which may be used with entire safety and great benefit.

In Upper Styria the peasants use it as a seasoning with many articles of food, such as cheese.

In a case of snake-poisoning in the West Indies, Dr. Ireland states that eight grains of white oxide of arsenic and eighty drops of tincture of opium was given in four hours; that is, one grain every half-hour, with the best effects.

Old worn-out horses by its use are endowed with new vigor and improved appetite.

In intermittent fevers it is used with great advantage; also in rheumatism and in rheumatic affections of the eye. In the douloureux, cardialgia, in whooping-cough, angina pectoris, epilepsy, and chorea, in hydrophobia, tetanus, and the bites of serpents the highest authorities regard it as among the most potent of all remedies. It is also used to advantage in the treatment of cancer. As arsenic is so often employed for the destruction of human life, there is a popular prejudice against it, yet it is not so poisonous as many other articles frequently used, such as prussic acid and strychnia, while its curative influence, as shown above, is very great and valuable. So, as members of a liberal profession, it would be becoming in us to strive to remove this unfounded prejudice rather than to popularize and encourage the ignorant hue-and-cry against it. I have no doubt that Mr. Gardiner died from blood-poisoning. It seems to me this is a marked case of septicæmia, and as arsenic is a very potent specific

for all snake poisons of the *Seps* order, as well as for septicæmia in general, may it not be, that had Gardiner at the proper time been brought under the constitutional effects of arsenic, his life might have been saved? It may be that the very element which is charged with his death might have been the means of saving his life!

The following paper, entitled "Protective Lining of Cavity-Walls," by W. A. Bronson, M.D., of New York, was then read by the author:

Comparatively few years ago, a filling composed of more than one material was considered to be intrinsically defective, and the insertion of such was held as unprofessional practice; yet, at present, fillings built up of two, or even three, different materials—three-storied fillings, so to speak—are neither uncommon nor decried. The causes of this marked change in practice I will not attempt to analyze; but, generally stated, I think they may be considered as involving three main principles,—1st, that we now fill and save teeth which would formerly have been extracted; 2d, that certain materials have been proved by experience to possess superior adaptability and value in certain classes or parts of cavities, and in certain kinds of teeth; and, 3d, that connection of different filling materials in one cavity has *not* been proved by experience to be detrimental to the tooth or the filling, as was so long held.

More than thirty years ago, a few practitioners, on occasion, made the bodies of certain fillings of *tin*, which they covered with *gold*; and this practice was denounced as unprofessional by the great majority of their brethren, on the grounds that the fillings were intrinsically bad, and that they were intentionally deceptive to the patient. But, within a few years, one prominent among us has announced that he *lines* many of his cavities (particularly those in soft and frail teeth) with *tin*, completing the operation with *gold*; and that he does so because he believes he is thereby enabled to insure more complete preservation of the teeth through the oxidation of the tin in the filling making a *chemically-preservative coating* to the cavity-walls. And, besides him, many of us are in the habit of making fillings of two or more materials on grounds more or less easily defensible.

The question of metallic *vs.* plastic filling materials has been much discussed within the past five years; the one or the other being strenuously advocated or as strongly deprecated for exclusive use according to the bias, experience, or whim of the discussor. Yet what has seemed to me to be the proper method of use of these two great classes of filling materials has been little touched upon. I refer to their employment *together* in such teeth and cavities as may be proper for such use.

The strategic point of all fillings intended to be permanent is, with-

out doubt, the entire exclusion of moisture, from whatever source, from the joint or junction of the cavity-wall and the filling material. Considered theoretically only, the complete attainment of this point is simply impossible by the use of metals alone against bare tooth-substance; for we can easily conceive the extreme difficulty of placing two hard substances, such as dentine and gold, in such intimate proximity, at all points, as to exclude a single molecule of water; and where one molecule can go another may follow it. Considered practically, the difficulty hardly decreases, as we all can attest; for we can but faintly assure *ourselves* of the certainty of permanency of such fillings, except under the most favorable circumstances. With plastics, theoretically considered, we should be *certain* of the intended result, were it not that *practical* difficulties, as *shrinkage* and *wear*, render these even less generally durable than the metals.

An inquiry as to the causes of failure in simple metallic fillings would lead to extensive investigations, beyond the limits of this paper, which I have not made; but some things in relation thereto have so forced themselves upon my attention as to have caused me to alter very materially my former methods of filling. A few of these ideas I will here state.

Some years ago I made gold fillings in smooth cavities in a steel plate, the plate being so arranged that the fillings could be removed without in any way mutilating them. I certainly expected that these fillings, inserted with all the skill and care of which I was master, would present surfaces as smooth and polished as the walls of the cavities in which they were constructed; and, to the eye, they did so. But a glass made apparent such dints, cracks, and crevices in these fillings as fairly astounded me!

A further examination of the walls of cavities in teeth, excavated with like care, showed even greater unevenness. What seemed to the eye and touch a perfectly smooth and even wall of dentine and enamel was proved by the glass to be marked by cuts, pits, and crevices, caused by breakage of the tooth-substance or by the angles of instruments.

When I realized these facts, I asked myself, What can be expected of fillings which are thus constructed? When, in a cavity with polished steel walls, gold is not ordinarily packed so as to obtain an equally smooth and polished surface, what shall we expect when we place a metal filling in a cavity where the *walls also* are pitted and creviced? The result will certainly be a doubling of imperfections at the very point where we desire—where we *must have*—perfection.

Another and well-known objection to simple metallic fillings (particularly large ones), when placed directly against bare tooth-

substance, lies in their susceptibility to variation of dimension through changes of external temperature, and to their easily and quickly communicating such changes to the tooth-substance upon which they are placed. Any change in their dimensions must work to the detriment of the tooth, by eventually allowing entrance to moisture between themselves and the cavity-walls; while the results of temperature change upon pulps but slightly covered with dentine need not be enlarged upon. Again, when necessity forces us to so shape a cavity as to render proper condensation of a metallic filling a matter of such great difficulty as to make its results quite problematical, we then feel the need either of some filling material, as generally good as metal, which shall be more adaptable to such cases, or we wish for aid from some source to enable us to insert the metal as securely and well as we are able to in plain cavities.

It may be said that metal fillings, placed directly against tooth-substance, have fully preserved teeth for many years without causing the slightest trouble. This is undoubtedly true. And yet I believe that undue importance has been given to this fact in discussions upon filling materials; because, as I think, the statement is true only as regards sound and strong teeth having cavities so situated and shaped as to almost insure good results in ordinarily competent hands. In other words, I believe that the very large majority of these long-enduring fillings will be found to be in positions the most favorable for them, as in grinding, buccal, and lingual cavities in strong and sound teeth; and that such fillings, in *proximal* cavities or in *frail teeth*, are not, to say the least, *common*.

A further, and (it appears to me) exceedingly strong objection to the practice of placing metals directly against tooth-substance lies in the well-known surgical fact of the greater or less incompatibility of various materials with living tissue. By "incompatibility" I mean that power, possessed by many materials, of exciting efforts in the living organism to expel the foreign substance, or to protect the tissues from its irritant action. Of this power the metals (with, perhaps, the exception of *lead*) have a greater portion than most other substances. Therefore, since the dental tubuli are tenanted with living matter, and since this living matter comes under the laws common to living matter in other parts of the system, I believe it is not the best practice to impose directly upon the dental fibrils a companion so uncongenial to them as a metal. We cannot, I think, consider a live tooth as composed of inert inorganic matter. We are, on the contrary, bound to consider it as a living organism, capable of being irritated by improper usage or applications; and also capable of efforts to abort the irritative agent. Hence we should so treat

this organ as to avoid, so far as is possible, the application of substances which we know are capable of exciting it to efforts which may end in its destruction.

Thoughts such as these led me to consider methods which might obviate, to as great an extent as possible, the objections against placing metal and tooth-substance in direct contact. Such a method, I think, may be found in the *conjoined employment of plastic and metallic filling materials in all cavities*. The principle of this method lies simply in lining the walls of the cavity (except at the enamel edges) with a varnish or a plastic filling material, against or upon which the metal is placed.

This use of plastics fulfills many indications, as follows:

1. Properly used, a varnish or a plastic secures the filling up of all crevices, pits, or scratches left in the cavity-walls after even the most thorough and careful excavation.

2. Such a lining also leaves a comparatively soft and yielding surface against which to pack the metal, into which the metal may be, in a measure, forced, and which will thus prevent harm from any inequalities in the metal, in much the same way as we secure an air-tight joint by screwing together two metal surfaces upon an interposed rubber packing.

3. In frail teeth, the walls, which would be incapable, when alone, of withstanding the force necessary to the proper insertion of a metal, may be strengthened and enabled to bear the strain by lining or partially filling the cavity with a strong plastic.

4. Teeth thus lined or filled are rendered comparatively secure from the effects of leakage from without, even if the metallic cap or filling should be imperfect; since, if the leakage then occurs, it can be only *between the metal and the lining*, and disintegrative moisture cannot then come in contact with the tooth-substance. This is true of the employment of such plastics as adhere strongly to the dentine, after the manner of a cement, as the oxychlorides and oxyphosphates and some varnishes.

5. Leakage from within (which generally means *discoloration* also), is prevented from being harmful in the same way; for, with an impermeable coating to the dentinal walls, coloring or disintegrating matters cannot penetrate the dentine, but must pass between the metal and the lining.

This matter of security against the effects of leakage is particularly valuable in the cases of chalky teeth, and of those soft teeth (chalky teeth) which appear to be so porous as to exist in what may be called a chronically *soaked* condition. In these teeth, when lined with an impermeable varnish or plastic, moisture, whatever its source, cannot get at the walls of the cavity; for, whether it enters the tooth

from within, by the canal, or from without, through imperfectly-margined fillings, or through the too porous tooth-substance itself, the walls are equally protected.

6. In the matter of compatibility with tooth-substance, experience seems to prove that the plastics or varnishes are infinitely preferable (less irritant) than the metals. By "less irritant" I do not mean that they are less likely to produce pain on introduction into the cavity; for the reverse is often the case,—witness oxychlorides. But such pain can be generally prevented by first using a coating of varnish—as copal-ether, mastic, Canada balsam, or sandarac—directly upon the cavity-walls before inserting the plastic filling material. In which case, as well as where the plastic does not cause irritation when directly applied, the after-effects are much more favorable to the durability of the filling than when the metal is used alone.

7. Plastic or varnish linings almost entirely prevent pulp-irritation through changes of temperature, being generally among the best of non-conductors. Also, in the case of shrinkage of the metal from such changes, the linings will continue to protect the tooth-walls, the leakage occurring only between the lining and the metal.

8. It may be objected that plastic linings will, if exposed to the oral fluids, dissolve, and lay bare the cavity-walls to the disintegrative action of those fluids. In theory this is undoubtedly true; but in practice we will find it is of rare occurrence. A strong, practically preventive measure to this occurrence is found in the fact that the *enamel edges are not covered* by the lining, but receive the metal in direct contact; when, if properly placed and packed, the entrance of moisture sufficient to dissolve the lining is prevented. No danger is to be apprehended from contact of metal with enamel; for this structure is practically dead to impressions conveyed through or by the filling; while its hard and dense character allows of much more smoothness and polish of its surfaces than the more open and softer dentine. And, also, so long as the dentine is kept from *disposition to decay*, I believe the enamel to be *much less* subject to disintegration than in other circumstances.

It may be said that, if we can always attain to such perfect marginal filling as I above indicate, the necessity for any further protection by linings is obviated. But we must not forget that other considerations than the mere exclusion of moisture from the interior of the cavity are to be thought of. The effects of thermal changes, discoloration of the dentine, and irritative effects of this structure by direct metallic contact are among the ill effects which non-conducting and non-irritant plastic linings almost entirely prevent.

In regard to materials for linings, it will be necessary at the present time only to mention briefly those from which the best results

have been obtained. The first of these is gutta-percha, either in chloroform solution, or better, spread thinly over the surface of the cavity with a warm instrument. Of gutta-percha this may perhaps be said: that used in too large bulk, its expansion and contraction may, in time, dislodge a weakly-anchored filling.

The oxychlorides will be found of very great value as being excellent non-conductors, and oftentimes giving needed strength to frail teeth. The oxyphosphates, when good, are even better than the oxychlorides, as being less irritant. The objections to these are that the best of them set so slowly as to prevent the insertion of the metallic cap at the same sitting, while many others set so quickly as not to allow so perfect an adaptation to the walls of a cavity as is necessary in a perfect lining material.

Of the varnishes, it may be said that they are not only admissible, but are very valuable in all cases. The solution of Canada balsam in chloroform is an excellent application in many respects. The alcoholic solution of sandarac is another valuable agent; also mastic spread by heat. Copal, dissolved in ether, so far as I have yet observed, appears to be superior in almost all respects to every other agent of this kind.

In conclusion, while the methods of filling indicated in this paper may be found to somewhat prolong operations, yet my own experience has been—and I believe that of those who pursue it faithfully will be—that it will be more uniformly productive of good results than the mode of applying metallic fillings directly to cavity-walls.

Discussion.

Dr. J. M. Howe. The protection of pulps from the irritation of metallic fillings is a subject of very great importance. For two or three years it has seemed to me to be of more importance than was generally attributed to it, and I have been in the habit of protecting the pulps in deep-seated cavities with some non-conducting material, and with the very best results. What led me to this course was observation of a large number of teeth with dead pulps, and the necessity of removing large fillings in order to treat such teeth. I at first adopted the plan of covering the bottom of cavities with oxychloride of zinc. I don't know who first suggested that, but I believe I killed a number of pulps by applying that material for their protection in cavities which closely approached the pulp. Although I always first saturated with creasote, I afterwards covered the bottom of cavities with gutta-percha where there was room for it, and then oxychloride, and in that way I believe I did not destroy any pulps. I have in a few instances varnished cavities, as a protection from the irritation of the chloride of zinc, as suggested by Dr. Bronson. In cavities that are

too shallow to admit of using the oxychloride in this way, I have used a covering of paper stuck fast to the bottom of the cavity. The use of paper for capping pulps, I believe, was first suggested by Dr. Francis. I have been pleased to find such treatment protects nicely from the effects of thermal changes. There is another point that has occurred to me in connection with this subject, and that is, when it is necessary to cut largely into sound dentine in order to form and shape cavities for the filling to be retained, I have come to believe that pulps will frequently bear less approximation in this sudden way than we often expect them to; retaining-pits made pretty close to the pulp, it seems to me, when filled with metallic substances, are much more apt to cause dangerous irritation than if the same approach had been made to the pulp by the slower process of decay. We may readily understand this to be the natural result of a deposition of secondary dentine in the latter case. I have been led to be very cautious in the preparation of cavities, and in many cases where it has seemed necessary to cut pretty deeply to properly shape the cavity, I have filled temporarily for six months, to allow the pulp to protect itself before inserting gold.

Dr. Coville. I listened with a good deal of interest to the paper Dr. Bronson has just presented to us, and I think there is much in it that will commend itself to the close scrutiny of many of us. More than thirty years ago I was in the habit of filling a portion of the cavities with tin and covering it with gold, but I abandoned the practice because of another dentist's misrepresenting my motive in using the two metals. For the protection of the pulp over which we are to place a metallic filling I have tried several substances, but I find nothing that satisfies myself so well, in cases where I can apply it properly, as a little asbestos. It is a perfect non-conductor, and I have used it repeatedly, and never to my regret.

While on my feet I want to announce the death of one of our old practitioners in this city, Dr. Thomas S. Holden, who died at his residence at two o'clock on Sunday morning, after a short illness.

Dr. C. S. Stockton, Newark. One thought Dr. Howe threw out is worthy of further attention. I think with him that there are a great many pulps destroyed by retaining-points. I do not believe very much in retaining-points myself, and I do thoroughly believe in temporary fillings. In many cases where there is proximate decay I think it a wise course to prepare such cavities, and fill the cavities and the space between the teeth temporarily with gutta-percha. Have your patient return in the course of three or four months; you have then performed the most disagreeable part of the operation, and your patient comes with no expectation whatever of being hurt. Mastication has caused the teeth to separate a little, and you have a nice

clean place to work in. I think this is a subject worthy of more consideration than we give it.

Dr. J. B. Rich. A remark has been made to-night in regard to asbestos, and to prevent unnecessary experiments I take the liberty of saying that although it is indestructible by fire, it is not a non-conductor. You may heat it red-hot and not destroy it, but it is important we should know it is not a non-conductor, except where there are large quantities of air-cells in the mass; the air being the non-conductor. I say this because, from the remarks of the gentleman who spoke on the subject, many persons might be induced to try a series of experiments which would end in disaster if they depended upon the asbestos as a preventive against thermal changes.

Dr. Coville. Please allow me to say that I can prove indisputably that asbestos *is* a non-conductor of caloric.

Dr. C. E. Francis called attention to some barbed broaches made by Mr. Johansen, and recommended them as being very soft and sharp.

Dr. N. W. Kingsley. I have used these broaches, and I think they are the softest and toughest I ever saw. They are so soft that I don't like to use them but in exceptional cases.

Dr. J. B. Rich. I must give my testimony in favor of these broaches, as being the very best I have ever seen. They are perfectly round, and have a very good quality in being barbed to the point. The integrity of the steel being preserved in their manufacture, they are capable of being tempered to any degree you wish. It is very easy to make them spring-temper in the same manner you would any delicate piece of steel. As we get them from the manufacturer they are the best fine instrument I have ever seen. They are certainly to be commended for the purpose of following the nerve-canals.

Dr. A. L. Northrop. Do you think they are as good broaches, taking them as they come from the manufacturer, as some of those which are stiffer?

Dr. Rich. That is a question to be decided by the person who uses them. A man with very delicate manipulatory skill, and a man of exquisite organization such as some men have, might use a very soft broach; but where persons do not have that great gift, it would be better for them to use them slightly tempered, or about the temper of an ordinary watch-spring.

Dr. B. Lord. I think the broaches in question are entirely too soft,—have too little temper, or, rather, none at all,—so much so that they do not offer sufficient resistance when we wish to use any force in getting into the pulp-canals, as is very often necessary. I would also object to the barbing. The barbs are too long, too many of them, and cut too far down the instrument from the point. I have given a good deal of attention to the making of broaches for our use,

having made them myself and having had them made by different instrument-makers, of the very best hammered bar-steel that could be procured, and I have found it almost impossible to get the temper right and uniform throughout the length of the instrument. This is, of course, owing to there being so little substance after the bar is filed down to the required size. Formerly, and I think now by some, these instruments were used without any temper at all, but like these broaches, they were too soft to be used with the greatest ease and facility. I have come to believe that the very best broaches that are used are made of piano-wire. The wire is tempered, or, rather, stiffened, by being drawn and compressed, and is uniform throughout. It is very tough, and just the right stiffness after the filing down to the proper size. On the whole, broaches made of this wire are the most trusty instruments of the kind I have ever used. They can be used with less fear of their breaking.

The barbing I much prefer to do myself, with a well-tempered chisel, beveled on both sides; and I like but a few barbs, and these near the point.

Dr. Reynolds. Dr. Bronson, I believe, in speaking of different materials to be used before capping with gold, stated that he objected to the use of gutta-percha or Hill's stopping on account of shrinkage. I would like to ask if he is satisfied from his experiments with those two materials that a plug partially or wholly made with these will shrink sufficiently to impair the filling?

Dr. W. A. Bronson. I made that statement from this observation, that a large cavity filled nearly full with gutta-percha is subject to so much expansion and shrinkage that it will throw out a cap of amalgam which is not very firmly anchored. I have attributed the coming off of the cap to that property of the gutta-percha. For that reason I don't put a large amount of gutta-percha as a lining in any cavity. I prefer to spread it over quite thin with a warm instrument.

Dr. Reynolds. I thank you. I made a statement similar to that some time ago, and I was told point-blank that I was mistaken. I asked the question not to criticise the paper, but only for my own information.

Adjourned.

ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

REPORTED BY JOS. R. C. WARD, D.D.S.

A REGULAR stated meeting of the society was held on Wednesday evening, November 5, 1879, at the Philadelphia Dental College, Dr. J. Lehman Eisenbrey, president, in the chair.

After the transaction of the usual routine business, the essayist

of the evening, Dr. William H. Trueman, read a paper on "The Causes of Crowded Dentures and Irregularities," prefacing his reading with a few introductory remarks:

In examining this subject we shall not attempt any description of the normal dental arch, nor yet consider in detail any special cases or classes of irregularities. Our object is to examine the peculiar anatomical character of the maxilla and the alveolar process; to endeavor to trace, though not minutely, the progressive stages of development by which the teeth successively arrive in their proper position, and consider, in a general way, the causes which lead, directly and indirectly, to irregularity, especially that form known as crowded denture. . . .

Dr. Trueman then gave a brief résumé of an address by Mr. Charles S. Tomes, on "The Bearing of the Development of the Jaws on Irregularity," before the Alumni Association of the Philadelphia Dental College (*DENTAL COSMOS*, vol. xv. (1873), page 292), accepting the conclusions of Mr. Tomes as to the development and construction of the maxilla, and the manner in which the force exerted by the muscular tissues of the lips, cheeks, and tongue moulds the incoming teeth into a regular arch, but taking decided exception to the idea that these forces alone produce the result. He believes there is a constant tendency in all the organs of the system to assume certain definite forms and positions; that there was and is a design or model which Nature always strives to duplicate, and these physical forces are merely called in to assist her.

Mr. Tomes well says:

"The point, upon which it is impossible to insist too strongly, is this, that the teeth, when they are erupted, do not come down and take their places in a bone already prepared for them; on the contrary, that which is there to start with is absorbed, and the bone in which they are ultimately implanted is built up around them, no matter what position they assume subsequent to their eruption. The inference to be drawn from this fact is obvious,—namely, that premature extraction of the temporary teeth is insufficient to cause contraction of the jaw; for, unless the bony bar which lies below our imaginary line be distorted, it matters very little indeed what happens above it so long as the permanent teeth meet with no obstruction during their exit from their cysts."

We do not desire to be understood, nor does Mr. Tomes, that the retention or removal of the temporary teeth is a matter of indifference. He simply asserts that this portion of the maxilla,—the jaw-bone proper,—in its development, is as separate and distinct from the alveolar portion as though it was not associated with it. The idea that its development is stimulated by the presence of the teeth;

that it increases in size to accommodate the incoming teeth, and ceases to grow when, from loss or non-development, this stimulus is wanting, we believe to be false.

The size of the dental arch is not absolutely fixed by the size of the jaw,—the alveolar process may occupy the inner or outer margin as readily as the center of the bone; the teeth may lean in or out,—sometimes to a great degree. Thus we may have a very great difference in size between the jaw and the dental arch. The relative position of the jaw, the alveolar process, and the teeth is determined mainly by the normal or abnormal operation of those forces we are now prepared to consider, which cause the teeth to assume the form recognized as a regular or normal dental arch.

The first force we recognize is identical with that which causes the offspring to partake of the form, shape, and character of the parent, and preserves the marked distinctions constantly observed between the various forms of animated nature. After this we recognize the physical forces Mr. Tomes minutely describes,—namely, the pressure along the outside of the dental arch constantly and symmetrically exercised by the muscular structure of the lips and cheeks, and on the inside the equally persistent pressure of the tongue. The natural result of these forces on a mass of plastic material placed between them would be to mould it into the form of a regular dental arch. Natural forces placed the teeth in a position where these physical forces can operate upon them, and in that measure, at least, contribute to their regular arrangement. . . .

Having now as minutely as need be recalled to your minds the anatomical relations of the teeth, the alveolar process, and the maxilla, and the two forces—natural and physical—which tend to place the teeth in their normal position, we are prepared to examine those causes which tend to so disturb this arrangement as to produce that condition technically known as an irregular or crowded denture. We propose to consider these causes in the order in which we presume they begin to operate. First, the intermingling and association of races, and the change produced by, and associated with, advanced civilization. Second, perverted nerve-force, or a disturbed co-ordination in the development of the teeth and adjacent parts. Third, misapplied physical force, either the result of muscular activity or the result of accident or habit. Fourth, inattention during or preceding second dentition.

In considering the subject of dental irregularity, we are reminded of the great physical degeneracy characteristic of civilized life, and especially its baneful influence on the dental organs. The ingenuity of writers has been taxed to assign causes for the numerous evils complained of. Innutritious food and food so prepared as to re-

quire but little effort to masticate, thus depriving the teeth of exercise and of the nourishment necessary for their full development; sedentary habits and the artificial life of civilized society, which unduly stimulates or perverts the nervous system; the changes of climate and the general disregard of hygienic laws and conditions, have been assigned as causes which have injured the usefulness and stability of the dental organs.

We are inclined to accept as true very little that has been written on the effect of diet. Man must accept that food which the country he lives in affords, and we have ample evidence that there is sufficient accommodation in nature to permit full and complete development on a diet upon which our modern theorist, if his theory were true, would starve.

We are not prepared to relinquish the luxuries of a modern kitchen for the raw cocoanut of our tailed ancestors. We hope to show you that there are causes more subtle and far-reaching than those the physiological chemist has presented; not that his theory is not good and his advice sound so far as it goes, and if followed would save many a heart-burn and bring peace and comfort to many a complaining stomach, but that it will not save the children's teeth from the effects of the sour grapes their parents have eaten.

We have noticed since the evolution theory has attracted attention a gradually-increasing desire to see in the physical evils necessarily associated with, and engendered by, civilized life, not only signs of a degeneracy of the human race, or of so much of it as is brought under its influence, but signs indicating a gradual change of type, especially with reference to the dental organs. Probably a dozen years ago, at a meeting of this society, a gentleman who had been examining and classifying the fossil remains found in the western mountain range of the North American Continent, and who had been impressed with supposed evidences of gradual structural changes in some of them,—some members being lost and others becoming highly developed,—while listening to a discussion on the increasing need of regulating, and other operations for the preservation of the dental organs, suggested, in a humorous manner, the possibility of this being a premonitory indication that, in the far-distant future, the human race might become edentulous. The remark was made and received as a joke,—whether that was the initial thought or not we cannot say, but we have been surprised to see how often it has been repeated in sober earnest; we have been surprised to see how persistently signs that might be made to favor the idea have been searched for and seized upon; the frequent cases of irregularity; the irregularity in the development and occasional absence of one or more teeth from the series; the delayed and occa-

sional non-eruption and defective character of the dens sapientiae, and the supposed increasing tendency to early loss of the teeth from decay or other causes, have been presented as signs indicating a purpose on the part of Nature to suppress entirely the dental organs at some future day. We have been surprised at the eagerness displayed in supporting this pet theory, and the forgetfulness of the plainest teachings of physical science. How very slight are the variations from a normal standard Nature is willing to tolerate! How very slight, indeed, the variations she is willing to perpetuate!

We admit freely—it is an undisputable fact that the infraction of natural laws entails upon a notable number of those living in civilized communities a greater or less degree of physical degeneracy,—a physical degeneracy that is transmitted from parent to offspring, and in its various forms is a prolific cause of irregular and defective dentures. Why will not this, in course of time, infect the entire race? Why will not this degeneracy, which in so many ways, direct and indirect, so seriously impairs the dental organs, probably inflicting upon them more serious injury than upon any other organ of the system, finally, by successive stages, cause their suppression? Simply because Nature has provided for the contingency: First, by a process of filtering (if we may be allowed the expression),—a separation of the good from the bad. The offspring of a weak and strong parent does not necessarily inherit a medium of physical strength. It may add to the strength of the stronger the best points of the weaker and escape its vices. So may the offspring, where both parents are defective, by uniting the best qualities of each, prove far superior to either. Secondly, by a process of extinction; the offspring inheriting only the vices of the parents, being either too feeble to reach maturity or too feeble to produce offspring. This is Nature's method of holding this degeneracy in check, and Nature's method of preserving in its purity the original type. Man's neglect of natural laws will lead to his extinction long before it can produce organic or structural changes.

Now let us advance another step and examine the effect which the intermingling of races, almost inseparably associated with civilized society, may have upon the subject under consideration. While every individual member of the human family (except in a few minor points) is an exact anatomical duplicate of every other, yet there are found certain traits of character and temperament, and certain variations of form and feature which have enabled ethnologists to divide it into various races, each possessing some marked peculiarities. When several distinct races have been thrown together, in course of time they become so blended as to really form a new type, and these, in turn, by the same process, form other types, possessing peculiarities

as marked and distinct, though not as sharply defined, as those distinguishing the original races. This may be noticed in some of the older nations,—England, for example. The modern Englishman is so perfect a blending of the various races from which he sprang that his identity is lost; the marked peculiarities of all are retained, harmonized, and united like the separate notes of a musical chord. This blending of various races and nationalities has not made him any the less a perfect man, nor changed his physical organization in the slightest degree. The same process is going on in our own country, and while, from causes we may presently name, it may produce slight temporary disturbances, we have no expectation that between the coming typical American and the present will be found any greater difference than exists now between the Englishman and his Saxon, Danish, or Norman progenitors.

This blending or clashing of individual or race peculiarities may affect the entire machinery of life, or any part of it, for good or evil; it may impair the nutrient functions and cause the teeth to be defective; it may impair the nerve functions and in various ways lead to irregular or crowded dentures; it may do this to a very marked degree without impairing notably the general health, or changing the normal size or form of either maxilla. We will not say this can take place without impairing the physical strength of the individual, yet it may occur, and the individual enjoy excellent health to extreme old age.

Coming closer to our subject, we call attention to the two extremes in shape, relative size, and expression of the head and face as seen in the various races. The intellectual is characterized by a massive forehead and small jaws and teeth, and the animal or brutal, by a low, narrow forehead, wide, well-developed jaws and massive teeth. What will be the probable condition of the dental organs and their surroundings in the offspring of these two extremes?

We have seen how thoroughly distinct anatomically the alveolar process is from the bone which supports it. Is it probable that the child may derive the maxilla from one parent and the alveolar process and teeth from the other? If this is so, we should expect to find not only crowded dentures, but jaws too large for the teeth. All crowded dentures are not necessarily caused by deficiency of room in the maxilla. We must remember that there is a constant tendency in all the teeth to move towards the mesial line. This is Nature's plan to provide some of the lower animals with an efficient masticating apparatus, and it seems to have been transmitted to man in common with many other mischievous tendencies. In many mouths badly crowded, there is sufficient room posterior to the last tooth to amply accommodate all the teeth in their normal position. This is some-

times hid by the integuments, but will be found more frequently than is generally supposed.

Nature has so much to contend with in maintaining animal life in its various forms that it seems practically impossible to keep all to the normal standard; hence this weeding out in the higher grades, while in the lower, instinct comes to her aid. The savage, in common with the brute to which he is so closely allied, looks upon the feeble or deficient offspring as an incumbrance and destroys it; the sick or injured are neglected—a rough and rugged life gives strength to the strong and kills the weak. This weeding out, we consider, has far more influence than the mere diet, or open life they lead, in producing their perfect physical development, their well-formed and enduring dental apparatus, and their great power of endurance.

We present this intermingling and association of races, and the various unhealthful conditions inseparably associated with civilized society, as the first and most potent factor in producing crowded and irregular dentures.

The clashing of temperaments, deficient vitality, and disregard of hygienic laws in the parent, and the excessive care with which the lives of all capable of living are preserved without any regard to their future usefulness, must and do tend to produce these conditions we are so often called upon to treat. Do not misunderstand me. I do not think that this influence, depressing as it is, is now producing or ever has produced any degeneracy in the race at large. We contend that it is strictly local both as to cause and effect; that it began when the various races of men began to associate together; that it has always continued as long as the causes which have produced it existed, and ceased when they ceased. It is not a peculiarity of modern times; it does not indicate any impending change in the normal type; it has produced no permanent effect, nor is it capable of doing so. We believe there are more physically perfect beings matured in civilized than in savage life. The only reason why the high physical development of the savage is so notable is, that with him those who make the dentist and physician so essential in civilized communities are slain in infancy.

As you may have gathered from the few passing glances we have given it, we have no faith in the theory of a marked tendency to a generally defective or crowded condition of the teeth in civilized communities. We have no sympathy with the idea that the teeth are becoming year by year more defective or more difficult to save, and utterly reject that latest evolution which sees in the gradually increasing appreciation of the dental organs and the dentist's labors a purpose on the part of Nature to entirely dispense with the dental organs! We believe the profession has been misled on this point;

they have failed to see that the increasing attention given to the teeth arises from an increasing *desire*, rather than an increasing *necessity*, for their preservation.

Dr. Trueman then referred to the very great physical and mental degeneracy of man, caused by inattention to natural laws, and to other causes at work in civilized communities at the present time; to the actual identity of the living of to-day with the well-preserved remains of those who lived thirty centuries ago, arguing that as there had been no change of type, nor indeed any change at all in consequence of the many vicissitudes which the human race has passed through, the degenerating influences associated with advanced civilization are only temporary, and furnish no ground for supposing that they will finally produce any permanent change in the dental organs.

Our second heading, perverted nerve-force or disturbed co-ordination between the development of the teeth and adjacent parts, is perhaps not so much a cause as a special manner in which the causes we have been considering manifest themselves,—an effect producing an effect. When we speak of nerve-force in this connection, or defective, or disturbed nerve-force, we do not refer to a defect in any one nerve or set of nerves, but in a general way to that force which presides over nutrition; that force which makes the beard to grow at its appointed time, and brings about those changes which enable the youth to lay aside his childish treble and proclaim his manhood in strong and vigorous tones. It is needless to describe to you how Nature arranges to implant full-grown teeth in a half-grown jaw, when the development is normal and the advent of the last replacing tooth delayed until the twelfth or thirteenth year. This, as you all know, is readily and successfully accomplished, but if from what we term perverted nerve-force the canine makes its appearance at about the ninth or tenth year, the patient undersized and the maxilla seemingly several years behind the teeth in development, we have a condition of affairs requiring close attention, and a possible explanation why some well-developed jaws are associated with crowded and irregular teeth. We may ask how do the jaws—that is, the maxillæ proper—increase in size? Do they increase evenly and symmetrically in every part, or is the increase in size mainly between the ramus and the last developed tooth? Again, if this increase in size is symmetrical, does it necessarily carry with it the alveolar process? Does it necessarily give the teeth more room? These questions are to be considered in our treatment of these cases. Can we safely disregard the present crowded condition, expecting that the maxilla will catch up with the teeth in a few years and thus correct the trouble? I have seen a few cases of marked crowding which Nature has corrected without treatment, but feel unable to say how it was brought about,

whether the natural increase in size of the maxilla or the change in the angle of the body and ramus of the lower jaw caused the teeth to take a larger circle, or whether that result was due to increased muscular strength or activity of the tongue. Before deciding to wait in these cases we should consider the injury the teeth may sustain from crowding or overlapping, and also examine the articulation, especially of the side teeth, and see whether it will impede or assist the desired correction, and here we may ask, Where Nature has made one mistake can we trust her not to make another? If the jaw normally grows symmetrically can we be sure that where the normal processes have been so disturbed as to produce a crowded denture they will not be still further disturbed, and still further depart from the regular method of development?

The causes we have been considering, so far, affect the matrix or bone in which the teeth are implanted, and compel their crowding by not furnishing sufficient room at the time it is needed. We will now advance another step. We have seen how materially the force exerted by the muscular tissues on either side of the teeth assists in arranging them in a regular arch, provided this force is exerted symmetrically, as it always is in a normal, well-developed subject.

Disturbed co-ordination of muscular action is frequently met with, and far more frequently in the child than in the adult. If we watch our little patients when they begin to cry or laugh we cannot fail to notice this irregular muscular action. Some people smile with one side of the face only; some masticate the food entirely on one side; in some mouths the teeth decay only on one side,—mostly the disused side,—partly because the disuse interferes with cleanliness, and no doubt largely because the same cause which has lessened the muscular activity of that side has so interfered with the nutrition of the teeth as to lessen their ability to resist destructive agents, and possibly also has made those agents more active.

This brings us to the first part of our third division,—misapplied physical force, the result of muscular activity. This we think is the frequent cause of a pointed arch, the laterals being crowded behind the centrals, and the canines being crowded out because of the first bicuspid's near approach to the laterals. No doubt other and varied irregularities are due in a greater or less degree to this cause.

In this place we may refer to those cases where development of the erupting tooth proceeds more rapidly than the absorption of the temporary tooth it is designed to replace, and as a result the erupting tooth slips to one side, and if absorption should almost cease, as it often does in these cases, the incoming tooth is misdirected and may appear far out of place. This seems to occupy a middle ground

between a physical and accidental cause, and is a type of those causes we refer to under this heading as accidental.

Under the head of habit we include those irregularities caused by sucking the thumb, lips, or tongue, or habitually keeping the lips or tongue in a constrained or unnatural position.

Our fourth and last division—inattention during or preceding second dentition—we may pass over rapidly. The cause and effect are so near together that we usually have no trouble in associating them. The early extraction of the temporary teeth, allowing the teeth posterior to the one extracted to follow their natural inclination to move forward, as well as failure to remove the temporary tooth when its room is needed; and inattention to the articulation as the permanent teeth successively take their places, are frequently the cause of irregularity. The very great defect thus produced is well shown in this model, which at first sight would seem to be a case of malformation or protruding lower jaw. The trouble, however, was that the upper centrals as they came down lodged behind the lower centrals, and if this trifling defect had been corrected this gentleman would have had a perfect denture. It was neglected, the laterals followed the centrals, and in turn the canines followed them; the lower incisors were pushed out; mal-articulation of the side teeth followed, and the entire lower jaw has been forced forward, producing a marked deformity and seriously interfering with its effective use. It is very important to closely watch the incoming teeth and correct as soon as needed any irregularity. A defect slight and trifling in itself if neglected may lead to very serious results, as this model forcibly illustrates.

The preservation of the temporary teeth is by no means a matter of trifling importance. They demand prompt attention, and demand it more imperatively than do the permanent teeth. It is especially important to preserve the molars intact, especially their approximal surfaces, so as to preserve sufficient room for the bicuspid and the canines. To accomplish this I am in the habit of inserting double-headed amalgam fillings in adjoining approximal cavities of large size, and have often succeeded in retaining this space by their use where from the size, shape, and position of the cavity I am confident other means would have failed.

We are not disposed to lay much stress upon hereditary transmission of irregularities. Malformations—as, for instance, a projecting lower jaw—are often family features, and as such are transmitted from generation to generation. So is also the peculiar separation of the centrals of either jaw occasionally met with, and also the absence of certain teeth or the presence of extra teeth. These are all due to deranged nutrition, a passive pathological condition,—as

readily transmissible as weak lungs or abnormal conditions of the heart or brain. But cases recited as hereditary, such as certain teeth overlapping or appearing in unusual positions, or a general crowded condition of the teeth, although it may have repeatedly appeared in the same family, or may have been repeated for several generations, we consider simply a succession of accidents, the cause and effect originating and ending in the same individual. This mystery of inheritance science has not yet solved. It is indeed a question whether acquired defects, especially local ones, are ever transmitted; perfect parents often produce imperfect children, and imperfect parents happily often fail to transmit their deficiencies. Isolated cases, therefore, are of little value in considering this question; the truth will be found only after a diligent, wide-extended search.

In conclusion, we desire to disclaim any originality in the ideas presented. They have been collected during a long course of reading, and have been collated and presented with such remarks of approval or disapproval as experience has suggested, for your instruction and our own. We desire to acknowledge our indebtedness to all who have written upon the subject; for while the explanation of the causes of a trouble, except so far as it suggests how the effect may be prevented, may be mere theory, it is impossible to say how far the discussions of the causes of irregularity have imperceptibly brought about those marked improvements in treatment which have increased our success, and very materially reduced the pain and discomfort attending their correction.

Dr. Chupein thought that irregularities existed to a much larger extent in America than in European countries, owing to promiscuous marriages. Here people of all nations intermarry, and their children inherit their different characteristics. For instance, the Germans have wide jaws and large teeth, while the Italians have narrow jaws and small teeth. The result of the union of these two extremes may readily bring about irregularity of the teeth.

Dr. Dorr claimed that activity increases development; that much harm is done by too great haste to correct irregularities; considers it essential to preserve the temporary until the time for the permanent teeth to erupt; that if care were taken to prevent their loss we would have less trouble. To correct irregularities the shortest way is often the best. In many cases he would extract teeth rather than attempt to move them.

Dr. Faught took exceptions to the views expressed in the paper on transmission. He accepted the theory of transmission of irregularities, and that even acquired irregularities are transmitted. Agrees that too much haste is often used to correct irregularities by extraction of temporary teeth.

Dr. Guilford said that the subject of irregularities had claimed much of his attention for thirteen years. As to the causes of irregularities there were different opinions, but he believed certain causes were hereditary transmission and accidents or injuries. He has no doubt as to the transmission of irregularities any more than he has as to the transmission of the color of the hair and eyes, protrusion of the jaw, or non-eruption of the laterals. The best way to prevent protrusion of either jaw is the extraction where this is threatened of the sixth-year molars, retaining those of the opposite jaw; would not hesitate to extract temporary teeth to correct irregularity, but does not believe in extracting the same teeth on each side.

Dr. Cryer believed in the transmission of irregularities; cited cases where the canines were wanting in three of the same family; had also seen the transmission of peculiarities in horses for several generations.

Adjourned.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE annual meeting of the American Academy of Dental Science was held on Wednesday, October 29, 1879, at Hotel Brunswick, Boston.

A very excellent address was delivered by Dr. C. A. Marvin, of Brooklyn, New York.

The following officers were elected for the ensuing year:

President.—J. L. Williams.

Vice-President.—T. H. Chandler.

Recording Secretary.—J. T. Codman.

Corresponding Secretary.—C. P. Wilson.

Treasurer.—L. D. Shepard.

Librarian.—H. F. Bishop.

Censors.—E. G. Tucker, G. T. Moffatt, F. N. Seabury.

C. P. WILSON, *Corresponding Secretary.*

CORRECTIONS.

AT the meeting of the Pennsylvania Association of Dental Surgeons held in Philadelphia, September 9, 1879, the transactions of which were published in the DENTAL COSMOS for December, Dr. C. N. Peirce is reported as saying that the operation of attaching a crown to adjoining teeth as performed by the writer before the Pennsylvania State Dental Society at Delaware Water Gap, in July last, "was not original" with me, "but had been done some years ago by Dr. B. J. Bing (now of Paris, France), in that case the attachment being made to two vital teeth."

Dr. Bing's method (as I have several times stated) was that of fitting and soldering a piece of 18-karat gold plate to a plain porcelain crown, and attaching to this a gold wire, then placing the wire and securing it with gold foil in a cavity prepared to receive and hold the ends of this wire in the depression in the palatal wall of each adjoining tooth. The operation as I perform it leaves no wire or 18-karat gold exposed. I strengthen the porcelain and restore the whole palatal portion of and build in the crown with cohesive gold foil, malleted to place in the proximate wall of each adjoining tooth (see DENTAL COSMOS for December, 1879, pages 667 to 672).

In all the operations that I have performed I have not attached a crown to any other than "vital teeth," though the teeth to which I built the crown at Delaware Water Gap (as well as those in some other cases,—not in all, however) were pulpless. When a pulp is lost the enamel becomes non-vital tissue, as does also a portion of the dentine, but the cementum remains in the same condition as before the death of the pulp, unless pericementitis and cementitis take place to such an extent as to tear the reticulum of living matter in the connective tissue or interfere with the re-formation of the basis-substance, and the normal condition cannot be re-established.

MARSHALL H. WEBB.

A misprint of my language in some remarks on gold foils before the New York Odontological Society, published in the DENTAL COSMOS for December, 1879, on page 688, made me say that *unannealed* gold could be folded, etc., whereas it should read *annealed* gold, etc.

BENJ. LORD.

BIBLIOGRAPHICAL.

THE THEORY AND PRACTICE OF MEDICINE. By FREDERICK T. ROBERTS, M.D., B.Sc., F.R.C.P., Professor of Materia Medica and Therapeutics at University College, etc. With illustrations. Third American, from the fourth London edition. Philadelphia: Lindsay & Blakiston, 1880.

This single volume of 1041 pages presents in clear style, and in concise, methodical arrangement, a compendium of the theory and practice of medicine, which we believe to be unequalled in the characteristics of comprehensiveness, thoroughness, and terseness. If a student, practitioner, or teacher cannot afford to own more than one volume upon the practice of medicine, he cannot do better than to invest in Roberts. The rapid sale which has made necessary the issue of a fourth edition in Europe, and a third edition in this country,

shows the estimate in which it is held, notwithstanding the multiplication of treatises upon the same subject.

WINTER AND ITS DANGERS. By HAMILTON OSGOOD, M.D., of the editorial staff of the *Boston Medical and Surgical Journal*. Philadelphia: Lindsay & Blakiston, 1879.

It is safe to say that attention to the teachings of this timely little volume (which is one of the "American Health Primer" series) would be the means of preventing a great deal of ill-health and suffering. There is condensed into its 160 pages valuable information on the dangers arising from errors in dress, carelessness and ignorance in bathing, inattention to pulmonary food, overheated air, indifference to sunshine, a sedentary life and neglect of exercise; on the dangers of school-life in winter, winter amusements, etc. It teaches the importance of equal care of the body as of the mind,—enforces the lesson of a physical morality. A winter evening devoted to its perusal cannot but result in a better conception of the duty of avoiding those every-day physical sins which entail evil upon ourselves as well as upon our children.

These books upon the care of the health cannot be too urgently recommended to the consideration of the general public, as furnishing in an inexpensive form important information upon the conduct and comfort of life.

PRACTICAL INFORMATION ABOUT THE TEETH. A Book for the People. By ARTHUR HOLBROOK, D.D.S. Milwaukee: Published by the Wisconsin State Dental Society, 1879.

I have read the above work, and must say that I am more than pleased,—I am delighted with it. It is a book of two hundred pages, printed in clear, large type, on fine, heavy, tinted paper. Each topic is elaborated much more satisfactorily than would be possible in a smaller work. The style is free, simple, and intelligible. The majority of people into whose hands it may be placed will read it with pleasure and be benefited by its teachings. It treats of subjects of importance to the general health of the individual, and which are not generally discussed in works of this character. The Wisconsin State Dental Society evidently intends that the patients which it represents shall not remain in ignorance of the physiology and hygiene of their teeth. They have placed the price of the work so low by the hundred that dentists can afford to give them away.

"Science Primers" are now the fashion, and a good fashion it is, for thus the public will become educated, and thereby placed in more favorable conditions for comfort and happiness.

HENRY S. CHASE,
St. Louis, Missouri.

PUBLISHER'S NOTICE.

THE NEW VOLUME—THE TWENTY-SECOND.

THIS number commences the Twenty-second Volume of the DENTAL COSMOS. Succeeding numbers will be issued on the first of each month during the year.

The average monthly edition during the past year exceeded six thousand copies, and the total number of pages of reading matter in the volume is seven hundred and four.

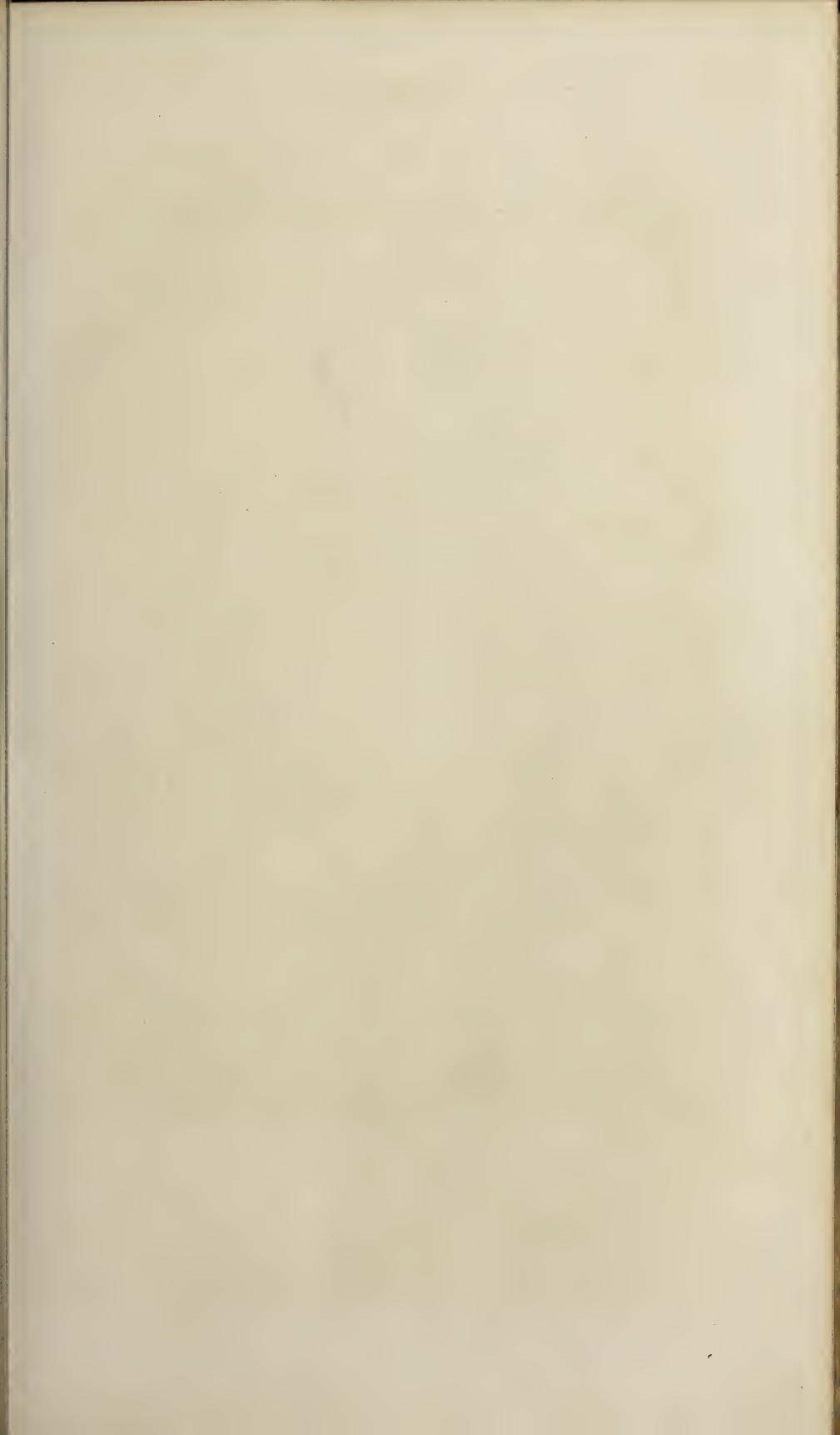
As to the value of the material which was thus presented to the dental profession throughout the world, the readers of the journal must decide.

As to the future, the publisher assures subscribers that no effort will be spared to make the volume for 1880 at least equal to its predecessor, and as much better as possible. Certainly it will continue to be a *dental* journal,—the contributions and selections having constant regard to the purpose of publisher and editor, viz., to make it indispensable to every intelligent dentist on the globe. To such position, indeed, it may truthfully be said to have already attained, its subscription list including the name of nearly every operator of any note, not only in all the States and Territories of the Union, but wherever throughout the world an English-speaking practitioner of dentistry is found.

The editorial management will be continued by Dr. J. W. White.

We ask that renewals and new subscriptions be sent in promptly, that we may with greater certainty determine the size of the edition required.

SAMUEL S. WHITE.





Phototype

F. Galehouse

Phototype

Samuel B. White

THE
D E N T A L C O S M O S.

VOL. XXII.

PHILADELPHIA, FEBRUARY, 1880.

No. 2.

OBITUARY.

SAMUEL STOCKTON WHITE, D.D.S.

DIED, at Paris, France, December 30, 1879, of congestion of the brain, Dr. SAMUEL S. WHITE, in the fifty-eighth year of his age.

This intelligence of the sudden and unexpected termination of the career of one who seemed but a few days ago to be in the fullness of his strength, will be received with a sorrow equal to the sad surprise. Although he had so long since attained the leading position which he occupied, we naturally looked forward to many more years of usefulness for him in the work he loved so well, and in the duties which he discharged so faithfully. A life adorned by personal virtue, consecrated to worthy aims,—a life of usefulness to the world, and especially to the profession of dentistry,—is thus untimely ended.

About the middle of November he had a slight congestion of the brain, from which he recovered quickly, but which was accepted by his physicians as an indication that he must at once seek a long-needed rest. In company with his son and daughter, and attended by his nephew, a physician, he sailed for Europe on November 19. He seemed to be rapidly gaining health and strength, until a little before Christmas a second attack of congestion occurred, to which he succumbed on the 30th of December. His remains were forwarded to his home, and, attended by his sorrowing family and

friends, were consigned to the bosom of our common mother earth on the nineteenth day of January.

Samuel S. White was born at Hulmeville, Bucks County, Pennsylvania, June 19, 1822. He was the eldest child of William R. and Mary (Stockton) White. His father died when he was eight years old. Soon afterwards his mother with her children removed to Burlington, New Jersey, where he resided until, at the age of fourteen, he was indentured to his uncle, Samuel W. Stockton, of Philadelphia, whose manufacture of mineral teeth was the first in the United States to attain any commercial importance, to learn "the art and mystery of dentistry and the manufacture of incorruptible teeth."

On attaining his majority he commenced the practice of dentistry in his uncle's office, and at the same time superintended his manufacturing department. In the following year (1844) he began the manufacture of teeth on his own account, in the garret of a dwelling-house at Seventh and Race Streets, uniting with it the practice of dentistry in an office in the same building. This was the initiatory step in an enterprise which has since grown to be the largest of its kind in the world. In a short time he removed to Race Street above Eighth, continuing both branches of his business. In 1845 he took in as partners Asahel Jones, of New York, and John R. McCurdy, of Philadelphia; in 1846 he relinquished the practice of dentistry in order that he might devote his entire time to the manufacture of porcelain teeth. The firm remained on Race Street till 1849, when it removed to a property on Arch Street below Sixth, which had been purchased and fitted up to accommodate the increasing business. In 1852 another removal to a still more commodious structure two doors below was necessitated. Branch houses were established, in New York in 1846; in Boston in 1850; in Chicago in 1858. Mr. McCurdy withdrew in 1859, and in 1861 Mr. Jones also retired, Dr. White purchasing the interests of both. In October, 1868, the imposing structure at

the southeast corner of Chestnut and Twelfth Streets, which had been erected by Dr. White, and fitted up expressly for the purpose, was occupied as a manufactory and depot.

Dentistry as a fine art may be said to date its beginning from Dr. White's entrance into business. The profession was in its infancy. The porcelain teeth which up to that time had been placed upon the market were in all respects but wretched imitations of the natural organs. To his persistent sagacious efforts to produce better results were due the wonderful advances attained in the teeth of his manufacture even thirty years ago.

The improvements in mineral teeth with which his name stands credited are numerous and important,—steady approaches toward perfection in many and various details. The older members of the profession will recall the progress made from time to time—the obstacles encountered and overcome: The translucency gained without the sacrifice of strength; the increased capability of resisting changes of temperature; the added strength with lessened bulk and weight; the modifications with special reference to the comfort of the wearer; the distinctions in shape in accordance with anatomical types; adaptability to varying conformations of maxillæ; the recognition of the artistic demands in replacement—the distinctive needs of differing sex, age, complexion, nationality, and general physical peculiarities; the faithful reproduction of the manifold deviations from absolute uniformity, including the minor as well as the more noticeable features, effects to disarm suspicion of artificiality, and forms to overcome the results of irregular or excessive absorption without violating æsthetic requirements; improvements also in the mechanics of substitution,—the means of attachment to the various bases—the bell-shaped, the double-headed, and the foot-shaped pins, and modifications of form specially applicable to the different materials used as bases.

When the improvements above enumerated, and many others not specified, are considered, it must be conceded that the advances in

dentistry as a prosthetic art from 1844 to the present time have been due in very great part to the steady approximation to perfection in all the essential characteristics of artificial teeth which the manufactures of Dr. White have so constantly maintained.

In February, 1847, the first marked recognition of his efforts was received,—a testimonial signed by many of the leading dentists throughout the country. This was followed, in 1848, by a gold medal, awarded by the American Institute of New York, and the first premium by the Maryland Institute of Baltimore. In 1849 a premium of a gold medal for the greatest improvement in the manufacture of porcelain teeth, offered by the Pennsylvania Society of Dental Surgeons, was awarded to him. From that time to the present no year has passed without testimony to the superiority of his manufactures in one respect or another, until medals and diplomas—aggregating now nearly fourscore—from all the principal industrial institutes of the country and from all the great international exhibitions, confirmed the position which he early attained as the leading manufacturer of artificial teeth in the world.

Not alone, however, in the special department of porcelain teeth did his manufactures hold unquestioned pre-eminence. In its early days the practice of dentistry was more a secret art than a broad science. At the time Dr. White began to supply the wants of the profession, dentists had only just begun to make public the results of their experiments and investigations. There were no manufactories of instruments for their special uses. Such as were made for sale were supplied by the surgical-instrument makers, and included only the simplest appliances; for the most part individual dentists made their own tools. As a consequence, those which had been found useful by any one practitioner were confined chiefly to his own office or laboratory; but as their advantages became known, the desirability of placing them within the reach of others made the establishment of a manufactory of instruments specially adapted to the needs of the dentist a necessity. With

characteristic sagacity Dr. White met this want, and this branch of the business extended, until the reputation of the dental instruments bearing his trade-mark became as wide-spread as that of his porcelain teeth. It is a remarkable fact and the strongest evidence of their superiority, that they hold as high a place in the esteem of the dental profession of Europe as in that of American dentists.

In appointments and appliances for the office and laboratory the various and steadily-growing needs of dental practice were constantly met,—and in an art so largely manipulative as dentistry the facilities and implements with which it is furnished have much to do with its success. In the rapidly succeeding improvements in dental engines and chairs, his unflagging zeal was shown by a series of triumphs which overcame all obstacles and produced results which commanded the admiration of all who appreciated their wonderful adaptation to the purposes which they were meant to serve. It seemed to be his mission more than that of any other man to lead and educate the profession to an appreciation and employment of time- and health-saving instrumentalities. He not only stood ready to meet its every demand, but seized upon and fostered every suggestion, resting only when the ideal became the actual. His ambition for progress and improvement led him to stimulate dental inventors, until the genius that conceived the thought rejoiced in its fruition. Thus it may be truly said that to a large extent he created the market which he supplied.

In the field of dental literature, the publication of the *Dental News Letter* for twelve years, commencing in 1847, and, following it, of the DENTAL COSMOS, now in its twenty-second volume, has had no small share in the growth of the profession in usefulness, self-respect, and public regard.

It will scarcely be disputed by any one familiar with the history of dentistry for the past forty years that in many directions no one man has exercised a wider or greater or more lasting influence upon

its development, not alone in this country, but throughout the world, than Samuel S. White.

He took an active interest in all that concerned the dental profession; identified himself with it and gave to its advancement the best efforts of his life. Though already overburdened with business cares, he accepted the leadership of an opposition to exactions by the Goodyear Dental Vulcanite Company, which he conscientiously believed were founded on an indefensible patent. His services and sacrifices in the position which was thus almost thrust upon him should be long and gratefully remembered by the profession in whose interest he acted, as, whether right or wrong, successful or otherwise, he was honest and earnest in his efforts in the legal contest of their claims, involving himself in personal suits for slander and "maintenance" with damages laid at \$175,000.

This brief memoir would be incomplete without a mention of his readiness to lend a helping hand to inventions and enterprises outside of his own business. He early became interested in the Harmonic Telegraph, and assisted Elisha Gray, its inventor, with the means necessary for its development. He never wavered for a moment in his faith in its ultimate success, or hesitated to furnish the required means promptly as called for. He was also a large stockholder in the American Speaking Telephone Company,—an outgrowth of the Harmonic Telegraph,—and gave much time and thought to prevent litigation about rival claims, and was largely instrumental in the adjustment and consolidation of opposing interests.

He was a patriotic and public-spirited man,—the first in America to respond to the call of the government for a loan in its early struggles with the rebellion. He was a humanitarian and a liberal helper in philanthropic efforts, disbursing continuously for many years with an unstinting hand in aid of charitable objects. He was a worker in the great Sanitary Fair, and one of those who subscribed five thousand dollars each towards the Centennial Exhibition. He was a member of the Union League, of the Reform Club, the Franklin

Institute, the Academy of Natural Sciences, the American Association for the Advancement of Science, the United States Board of Trade, and many other business and benevolent associations.

As a man he was modest and unassuming, charitable and respectful to others, yet never forgetful of self-respect; courteous, cordial and simple in his manners, uniting dignity and urbanity. Few men are to be found more free from faults, and none of greater probity or purer designs and aspirations; calm in danger, cool under difficulties, wise in council, a kind husband, an indulgent father, thoughtful and considerate as an employer, a steadfast friend, a diligent worker, a man whose word was as good as his bond.

He believed that religion was a life, not a ceremony,—a love of good and a hatred of evil. All his actions were regulated and subordinated by this conviction. Industry, honesty, truthfulness, integrity, justice, forbearance, forgiveness, benevolence, and love characterized his life. Service was to him easy, sacrifice a pleasure, and duty a delight. He was a manly man, possessed of "the manliness of love, the manliness of truth, the manliness that wears the spirit on the brow, the manliness that bears the heart in open palm, no plan or purpose that he feared to show." His motives were pure, his ambitions noble, his mind devoted to truth, his conscience pledged to the right.

We shall miss his kindly greeting, his ready hand, his sympathizing tear, his generous heart, his upright walk, his noble example worthy of imitation; but his influence, though unseen, will be felt and transmitted to generations which knew him not; and although passing away at a comparatively early age, yet reckoned by the work he has done instead of by the years he has counted, he may be said to have attained the fullness of life.

ORIGINAL COMMUNICATIONS.

PLASTIC FILLING.

BY J. FOSTER FLAGG, D.D.S.

PREMISING that the decided advantages which would accrue from a gradually increasing employment of plastic filling materials in connection with efforts for the saving of teeth, *below medium in quality*, are fast becoming recognized by a very large portion of the practitioners of dentistry, and believing that their successful utilization depends as much upon a *scientific adaptation of means to ends* as does the successful utilization of gold depend upon *manipulative ability*, I purpose offering some suggestions which, while they cannot educate to the use of "plastics" from the high analytical stand-point that must *entirely govern* this when based upon future collegiate instruction, will, nevertheless, give such aid to those who desire to experiment in this direction as will enable them to produce results which will be eminently satisfactory alike to patient and operator, and this, too, in the very cases where even the most skillful manipulators in gold yet fail ignobly.

To this end I shall first discuss the indications which point to the employment of any *single* plastic material for the making of a filling, and then pass to the consideration of those *combinations* which are the *essentials* to the perfect development of that system of tooth salvation which is based upon the electro-chemical theory of Dr. S. B. Palmer, and which attributes the failure in operations *mainly* to "incompatibility of filling material with tooth-bone."

GUTTA-PERCHA.

This material was offered for dental consideration about thirty years ago.

It was suggested as a *temporary stopping* for frail teeth, and was recommended for its ease of manipulation; its non-irritating and non-conducting qualities; its insolubility in the fluids of the mouth; and its reasonable resistance to attrition.

These desirable characteristics caused it to find favor in a limited degree, even though its color—a dark brown—was very objectionable; but, upon the introduction of a mixture known as "Hill's stopping," and supposed to be composed of gutta-percha, quicklime, and pulverized silex (a supposition probably entirely erroneous), it was quite promptly accepted with marked favor, and soon took position as a very valuable adjunct in practice.

Its inventor, Dr. Hill, had quite exalted ideas of the value of his invention, for he stated that while he did "not expect it to supersede

gold entirely," he nevertheless believed that it could be "advantageously substituted for that material in many instances."

The advocates of the "compatibility theory" believe, at the present day, that his views were correct, and that if they had been very much more universally accepted, the result would have been a vastly better record in the saving of teeth.

Other compounds, of a like nature, were soon introduced as "superior," but with little or no just claims to such distinction, as, after trying a great variety of ingredients for the purpose of whitening the gutta-percha without seriously impairing its toughness, nearly all the better grades were, and are, composed only of *gutta-percha* and *oxide of zinc*.

Like other manufactured articles, it was soon found that *much more depended upon the art of manufacture than upon the components of the filling material*, and at present the relative quality of the various "makes" is due entirely to this.

Early in the use of gutta-percha stoppings it was noticed that "remarkable results" were being attained, and those who were investigating these with a view to the future modification of practice came in due time to regard them with exceeding favor.

It was gradually accepted that gutta-percha had its place not only as a "temporary filling," but as a stopping of *extraordinary permanency* having but two demerits of note, viz.: inability to resist the attrition of mastication, and a degree of shrinkage which permitted *leakage* and a consequent "clouding" of the filled tooth.

The first of these objections was only to be overcome (*in the use of the one material*) by restricting its employment to such cavities as were so situated that but little or no attrition would result from mastication, and by directing especial avoidance of friction from the brush during the cleansing of the teeth.

The second objection was by no means so easily disposed of. In fact, after much thought and experimentation it has been found practically insurmountable.

Solutions of gutta-percha were tried as "linings" for cavities more than twenty years ago, but the shrinkage from evaporation was proved to be even worse than that from cooling, and as it was indispensable that the material should be heated in order to be properly introduced, it was finally announced that the best gutta-percha fillings leaked, but that this leakage was not detrimental *except so far as it permitted slight discoloration*.

The gutta-percha filling materials of the present day are divided into *three grades*:

1st. Those of "low heat,"—having sufficient plasticity for manipulation at temperatures ranging from 140° to 200° Fahrenheit.

These are always to be warmed over water, and are particularly applicable for filling portions of canals and the bulbous parts of pulp-cavities; and for covering almost-exposed pulps to prevent danger from irritating medicaments employed as obtundents for sensitive dentine; and as a *first layer* of filling in "deep-seated" cavities of decay.

They should not be used for "outside work," as their resistance to attrition is quite moderate.

I refer here *exclusively* to "low grade" *white* gutta-perchas, for it is never the case that *red* gutta-percha base-plate (a very useful and *eminently serviceable* filling material) is of higher grade than 150° or 180° Fahrenheit.

2d. Those of "medium" grade,—such as become plastic at temperatures ranging from 200° to 210° Fahrenheit.

In my opinion these are the *best* gutta-perchas for *general use*, for the various reasons that they can be warmed over water, thus insuring against "heat-rotting" from overheating; that by this means they are prevented from being injured from *repeated* heating, and that they possess sufficient consistence, toughness, and resisting capacity to subserve the purposes of an excellent and durable filling.

3d. Those of "high heat,"—which do not become sufficiently plastic for manipulation at less than from 216° to 230° Fahrenheit.

As these will not soften over boiling water they have to be heated upon a metal or porcelain plate, or over the flame of a spirit-lamp. This requires much care, as it is essential to good results that they be *very gradually heated* lest they suddenly swell and deteriorate, and that they be not overheated, as then they disintegrate and become "heat-rotted."

Much of the obloquy which has attached to gutta-percha work has unquestionably been due to ignorance of these facts and to consequent mismanagement of the material, and I have never yet conversed with any gentleman that denied the *permanency* of gutta-percha fillings who did not heat his filling material either upon a plate of porcelain or metal, or worse yet, over the flame of the spirit-lamp.

I would state here that the value of gutta-percha stopping is not to be determined alone by the "heat test," for *it is easy to raise the material to any reasonable degree by simply increasing the relative quantity of inorganic admixture*, but this very increase is destructive to value by overloading the gutta-percha.

All other things being equal, that gutta-percha stopping which gives the highest heat test with the least admixture of foreign material is the best.

Although gutta-percha has been proved to make a reasonably good

stopping in cavities from which it was found impossible to exclude the moisture, it is nevertheless essential to *as perfect a filling as can be introduced that dryness be maintained* during its introduction.

If this is not possible, I should recommend the employment of the *red base-plate* in preference to any preparation of white stopping, warming it over water, and using *cold* instruments for its introduction, which should be *touched to an oil pad* to prevent adhesion of instrument and consequent "drawing" of filling material.

NOTE.—The *oil pad* is conveniently made by cutting a groove with a small corundum wheel, around the end of any ordinary *flat top* glass stopper, and then, stretching a piece of chamois-skin over the end, securing it by a ligature of bookbinder's thread in the groove.

After properly trimming the chamois-skin, a drop or two of sewing-machine oil saturates it and it is ready for use.

This little device is *essential* not only in gutta-percha work, but in connection with the manipulation of the zinc-phosphates also.

In all cases where dryness can be maintained I should prefer to use the white preparations. These should invariably be introduced by means of *warm* instruments, as the necessary degree of heat for *deliberate and accurate* manipulation can only be retained to the gutta-percha in this manner. For this purpose a combined gutta-percha and instrument warmer, of any desirable pattern, should be used.

The gutta-percha should be heated either over water ("low heat" or "medium") or upon a metal plate ("high heat" only), but the instruments should *always* be heated upon a metal plate,—this insures that they shall be *hotter* than the gutta-percha, and thus that they shall be as warm when taken from the plate *and carried to the mouth* as *was* the gutta-percha when taken from its place over the water-bath.

Another advantage, and a very great one, which is attained by an instrument warmer, is the ability to heat at one time all the various instruments required in any given operation; this will be found quite desirable, and to result in a great saving of time.

Again, instruments heated in a flame are very liable to leave traces of soot upon the filling, while those heated upon a plate always leave it in a neat and presentable condition.

The instruments best adapted for the introduction of gutta-percha fillings are *certain forms* of those used for the manipulation of cohesive foil.

It is important, however, to note that instruments intended *especially* to consolidate gold foil by the force of "direct impact" are *least of all* indicated for use in the introduction of a gutta-percha filling, for *the principles which govern the durability and value of a foil*

filling are precisely opposite to those which govern the durability and value of gutta-percha fillings.

For the perfect introduction and consolidation of foil it is essential that free and fair ingress to the cavity shall be obtained, and for this purpose it is frequently necessary to cut away considerable portions of both enamel and dentine.

For the integrity of foil fillings it is regarded as better that the walls of the cavities should possess a reasonable degree of both thickness and strength.

On the contrary, for the perfect introduction and compacting of gutta-percha it is *not essential* that nearly so free ingress to the cavity should be obtained, while *it is essential* that the largest possible portion of both enamel and dentine should be *carefully conserved*.

The *most important* of this tooth-tissue is *just that which should be cut away for foil work*, and upon the *preservation of this* depends, almost entirely, the value of the gutta-percha work, as it guards against attrition a material which, while it is eminently more tooth-preserving than gold, is wanting in the physical characteristic of resistance to mastication.

Again, for the integrity of gutta-percha fillings it is not regarded as important that the walls of cavities should possess, in much degree, either thickness or strength, as it has been *thoroughly demonstrated* that some of the most signal triumphs of gutta-percha have been in teeth in which gold fillings of magnificent workmanship had failed repeatedly, until the remaining walls of the now enormous cavities were almost as thin and frail as *letter-paper*!

Therefore serrated points of such *curves* and *angles* as have been found best to meet the requirements in difficult and inaccessible cavities are those recommended for the *introduction* of gutta-percha fillings.

The instruments best adapted for *finishing* gutta-percha fillings are thick and thin, convex or flat burnishers; these, together with the occasional use of a large or small ball burnisher, will be found to meet all requirements. These should be heated in the same manner as are the pluggers.

The filling material and instruments (both plugging and finishing) being properly warmed, the gutta-percha should be taken in small pieces—piece by piece—from its plate by means of a moderately fine probe, and thus carried to the cavity and placed in position. If practicable each piece should be made to adhere to the wall of the cavity, and then be accurately packed into position by the appropriate plugger, until the cavity is either entirely lined, or is partly filled, when the completion of the operation is only a question of a short time; but when this adhesion of the first pieces is difficult, they should be held in position by the probe until they are made to adhere

to the walls by the use of a plugger, when that adhesion should, in turn, be maintained by the plugger, while the probe is carefully withdrawn.

It is an important consideration that accuracy in amount of filling material should be regarded, as thus the minimum of surplus will remain for removal prior to finishing.

During the removal of surplus material, and the final smoothing of the filling, it should always be remembered that the work must be *toward the edges of the cavity*, as thus the filling is maintained "flush" and the gutta-percha kept close to the walls.

While finishing, it will be found that moisture is not only *not detrimental*, but in some cases rather advantageous, as it permits a smoother cutting of the gutta-percha.

In *dry* finishing, only that portion of the filling material which will adhere to the instrument *from one touch* should be removed at a time, as retouching will complicate and retard progress rather than be productive of advance.

Durability of Gutta-percha.—It was quite a number of years after the entrance of gutta-percha into the list of filling materials before it came to be regarded by any operators as other than subservient for "temporary" work, but, after a time, cases began to multiply in which fillings inserted *avowedly* as "temporary" continued to do good service in such manner as to excite both curiosity and professional interest as to the length of their possible durability.

It was next noted, as years passed by, that the gutta-percha fillings had actually lasted, *in many instances*, longer than the gold fillings which had been previously introduced.

Results such as these, in my own practice, together with corroborative comparison of views with others, induced me to institute an extended course of experimentation in this direction.

As the result of over fifteen years of careful observation, and with a basis of over *two thousand* replacements of gold with gutta-percha, I find that, "properly used," gutta-percha is *at least twice* as durable as gold, and that in *very soft teeth*, in selected places, it is fair to presume that it will preserve its tooth *at least three times as long as well-introduced gold fillings*.

I wish it to be understood by the profession that I do not make this statement as an *opinion*, but as an *assertion* vouched for by long, carefully tabulated records, and as a basis upon which the operators of the future may found a satisfactory, tooth-saving, and comfort-giving practice.

Cavities in which the Use of Gutta-percha (alone) is Indicated.—In former years the cavities in which experience seemed to have conclusively proved the capability of gutta-percha for making a reliable

tooth-saving filling were much more numerous than at present. At that time all circumscribed cavities upon the mesial or distal faces of *soft teeth*, as well as many cavities upon the labial faces of incisors and cuspids and the buccal faces of bicuspid, and especially large cavities upon the buccal faces of molars near to and even beneath the gums, were regarded by gutta-percha workers as the places where they achieved their greatest triumphs.

Gradually, as "combination fillings" began to be recognized as advanced practice, the legitimate use of gutta-percha alone has become restricted, 1st, to large cavities approaching the pulps, and having thin, frail walls located upon the buccal faces of molars and bicuspid, either superior or inferior; 2d, to circumscribed cavities upon the mesial or distal faces of incisors, cuspids, and bicuspid having reasonably thick walls *labially* and *buccally* (sufficiently so to prevent "clouding" from leakage), and having an unbroken articulating wall of sufficient strength to resist the action of mastication.

In *soft teeth* all these requirements are but infrequently found, and thus it is that, at the present day, the strictly legitimate use of gutta-percha *alone* as a filling material is almost entirely confined to *large cavities, having thin, frail walls, located upon the buccal faces of molars.*

(To be continued.)

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR meeting of the society, held at the residence of Dr. Charles Miller, Tuesday evening, November 11, 1879.

Vice-President, Dr. A. C. Hawes, in the chair.

INCIDENTS OF PRACTICE.

Dr. W. H. Dwinelle. It is often desirable to break up the articulation between the upper and lower teeth for a greater or less time, especially when you do not desire any impinging or contact upon any particular tooth or crown that you may be constructing. Sometimes it is done by fixtures of celluloid, vulcanite, or plate. Dr. Palmer and myself had a case to-day wherein we found it very convenient and very practical, inasmuch as we had very little time to spare, to simply build up an abutment on the teeth with Weston's cement. We have used it in such cases for some time past. We had to build a crown upon a tooth in accordance with a process which I published in 1855, wherein a crown of gold is constructed by attaching a curbing of gold around a root, soldering on cusps and grinding surfaces, and then attaching in its place by screws.

We found it expedient not to have the lower teeth articulate upon it,—this being a superior bicuspid. It was the work of a moment to mix a little Weston's cement and place it upon the teeth immediately behind, so that when the teeth were closed those in front escaped contact. It has the quality of stick-to-itiveness—to coin a word for the occasion—and retain its position even upon the walls of the polished enamel. It hardened in a few moments, and we found it operated admirably. It would have taken hours to produce this result by the old method. Our patient will be all right to-morrow morning for proper articulation of the artificial tooth.

Dr. N. W. Kingsley. Last spring my attention was called to a case of double harelip and cleft palate of a very bad character. My first knowledge of the case was an exhibition of wax models before the District Society by Dr. D. L. Little, who operated on the lip. Shortly after that evening Dr. Little sent the patient to me to see if I could do anything for him. It was a charity case. The boy lived in New Jersey, and was in St. Luke's Hospital only while Professor Little was treating him. I became interested in the case because it was the widest gap in the roof of the mouth I had ever seen. In operating, Dr. Little took away entirely the intermaxillary bone, which was hanging to the septum of the nose. His operation was so successful that he made a very respectable upper lip where before there was no lip. There was a fissure from the mouth through to each nostril, and the portion which was between the two fissures was so small that he was without any upper lip, and consequently could utter but few sounds of the English language that could be understood. About that time I tried an experiment with him in the presence of a number of eminent surgeons of this city. Certain slips of paper were there presented containing nearly all the different sounds of the English language, and the boy attempted to make those sounds. He also attempted to read, and the uniform testimony of the gentlemen present was that they could not distinguish in his reading a single sound or syllable. I made for him an artificial palate, and he went to his home near Frenchtown, New Jersey. I did not see him again until about ten days since, when I found him talking horribly,—very little, if any, improvement had been made. I have maintained that I could give such people the ability to talk and could direct them how, but I could go no further, and here was a case in point. I had given to this boy, I believed, the ability to talk,—that is, the machine, the instrument, the organ,—but his speech six months afterwards was as bad as ever. When he tried to speak it was an unintelligible mixture of guttural sounds.

Ten days ago I took him under my training, and drilled him for half an hour or more at a time daily. I intended to bring him

here to-night, but it seems he has a tumor upon his thigh, and Dr. Little engaged to operate upon him to-day at St. Luke's Hospital, and invitations were sent to a number of surgeons to be present; as the invitations could not be countermanded I am unable to show him here as I had expected. Dr. Little told me yesterday that he had accepted an invitation to show the boy before a medical and surgical society in Brooklyn, and wanted me to go with him. I did so, and it may interest you to know what occurred there. Dr. Little took his models showing the deformity before he operated, and the boy could show for himself the result. The palate was out of his mouth, and he was examined by the members of the society. Our first experiment with his articulation before the society was his reading a few sentences from a paper without his artificial palate. I could understand a few words only; the other gentlemen said they could not catch a single syllable. The palate was introduced, and I asked him his name and where he lived, and he answered with the utmost distinctness; I asked him who had made his palate for him, and he pronounced my name perfectly. My name, curiously, contains some of the hardest sounds that cleft-palate patients have to master. When a patient can pronounce my name, with the prefix of doctor, he has pretty nearly mastered the English language. I then handed him a passage to read, and I assure you, gentlemen, I was myself astonished at the result, although I knew what to expect. He read the passage as distinctly as I am talking to you now. Of course the effect upon the audience was remarkable, and again I regret my inability to bring him here. I made for that boy an artificial velum, and I do not think as good results could have been obtained by any other form of apparatus. Nevertheless, twenty years' experience has shown me that a soft palate is not always the best thing in these cases, but it has taken me nearly twenty years to find it out. I have seen within the last month as perfect a duplication of one of my soft palates as one man could make of another's work, so perfect that when it was first presented to me I thought it was mine. And yet the individual who was wearing it was receiving no benefit from it whatever. For his case that kind of an instrument was not the best. Neither is a plate covering the roof of the mouth and filling the fissure, extending back as far as it could be tolerated, of any material value to a patient in articulation, and yet an obturator can be made which will be of as much value as any other instrument. I have before me two examples. One is made of platinum, and is of the most delicate workmanship. The bulb at the back is as large as a Spanish chestnut, but you will be astonished at its lightness. The metal is thinner than 36 by the plate gauge. It is a duplicate of an instrument now being worn by a gentleman for whom I had made a soft artificial palate a

number of years ago. After wearing that for a few years I exchanged it for an instrument like this, which, in his case, produced better results. That was some two or three years ago, and within the last few weeks, by his desire, I have been making this duplicate, so that in the event of any accident to myself or to his instrument he would not be helpless. It is so valuable to him and so valuable to me that I might say one thousand dollars would not tempt me to have this one destroyed and thus have to do my work over. It is very difficult to make of metal an instrument of that kind.

I have here another instrument in which the bulb is made of vulcanite. Like the other it is hollow, thin, and extremely light. Furthermore, I can detach it from the plate in case the plate needs repairs. I am not quite certain that the metallic bulb possesses any marked advantages over the vulcanite, while it is a great deal more difficult to make.

Dr. Kingsley here described a little experiment which he had made to test the absorbent powers of different kinds of Japanese bibulous paper. He made a balance of a slip of wood about a foot long and an inch wide. At each end was placed a glass cup, made by cutting an ounce bottle across the middle, and secured to the balance by sealing-wax. This improvised scale was balanced on the edge of a knife-blade, and the cups half filled with water, adding drops to secure an exact balance. Pieces of paper of different kinds, but of the same size, were made into a roll as nearly alike as possible, and one placed in one cup and another in the other. Dr. K. had no name by which he could distinguish the two kinds other than that one was purchased at the dental depots and the other at Van Tine's importing house. The Van Tine paper was found to not only take up about one-third more water, but also to become saturated in about one-third less time. By removing both pieces of paper and dropping water into one cup until the cups again balanced, the exact difference in the amount of water taken up could be ascertained.

Dr. Kingsley also exhibited a support for the engine cable, which possessed some advantages over any other yet made.

Its superiority consisted in the spring or support being made of steel wire, and so arranged that the bearing which sustained the cable could be shifted a distance of six inches or more. He claimed two advantages from this change of bearing over a stationary bearing: first, the cable would be much more durable; and, second, there was more freedom of movement when the bearing was pushed back, which was very desirable under some circumstances.

Dr. W. H. Dwinelle. I am not called upon to speak, but as the time is not occupied, I would like to say a few words in regard to cleft palates. Many years ago, two friends of mine had a child, who

was unfortunately born with a cleft palate and harelip. Dr. Carnochan of this city operated for the harelip. The cleft palate was reserved for the future. I told the unhappy parents that when the boy arrived at maturity I would see he had the best appliance for the curing of his imperfect speech, having in view Dr. Kingsley, as he at that time was already beginning to make this department of our profession a specialty. In the course of time the young man came to maturity, and, as I wished, came under Dr. Kingsley's charge. He remained at my house while he was treated. I took a great deal of pains with the young man, and drilled him constantly in the mechanics of vocalization. He made considerable progress while he was with me. Dr. Kingsley made for him an appliance providing him with the instrumentality of vocalization, just as good as the doctor ever supplied to any one. There Dr. Kingsley's office, in a large sense, if not entirely, ends. He supplies the instrumentality of vocalization. He supplies the piano, so to speak. You can play upon it if you choose to practice, but if you do not practice and do not succeed, you have no right to decry against the instrument. A girl of fifteen will sit down at the piano and play the music of all the operas, simply because she has practiced, and has that facility and ability by which she is able to discourse sweet sounds. Another does not practice, and fails. Who shall blame the piano for the failure? Nothing need be reflected upon Dr. Kingsley's skill, any more than a stupid novice can reflect upon Steinway, Chickering, Weber, or any piano-maker for his failure. My young friend was supplied with this delicate and wonderful instrument on which he was to practice; the more he practiced the more perfect he would become. He got so that he mastered most of the difficult gymnastics of vocalization. He could say *Kingsley*, which was a very hard word,—no reflection upon the doctor. The family name of *Kellogg* he mastered also, which was quite as difficult. He lived in *Cazenovia*, which is a very hard word to pronounce for a man who has a cleft palate. He lived eighteen miles from *Syracuse*, which is another difficult word. I rung the changes upon these words, so that he articulated in a very satisfactory manner, and I dismissed him, although I wish he had stayed with me a month or two longer; but I had so drilled him, and so had Dr. Kingsley, that I felt he had so far progressed that he would be able to walk and talk alone. He went back home. I heard nothing from him, but supposed he was progressing forward and not backward. This summer I had occasion to go to Cazenovia. In conversation with his mother I was surprised, mortified, and disappointed to learn from her that he was no better with the instrument than he was without it. That they could not distinguish any difference in favor of better articulation. I was disappointed, because I

felt a responsibility in the case. I had had the case at heart, to a greater or less extent, ever since the child was born. I had prophesied upon it; I had pledged the credit of my profession; I had pledged the credit of my friend Kingsley upon it, and indorsed it myself. I could not understand it. The young man had gone to seek a home in the West, but a younger son was at home, who, to my astonishment, I found articulating in a very slipshod sort of a way. In speaking of his Uncle Kellogg, he called him *Hellogg*. Instead of Syracuse he would say *Heracuse*, and for Cazenovia, *Hazenovia*, and yet when his mind was particularly directed to it, his articulation would be perfect. I examined him and found all his organs were normal, and nothing to account for his imperfect articulation. You know that a person with a cleft palate has to resort to all sorts of arts and expedients to supply the place of the natural organs of speech. The lips, the tongue, the cleft palate, the divided velum, the pharyngeal wall, all have forced upon them offices illegitimate to themselves, and the best result of their combined effort is to produce but very imperfect articulation. By these influences a habit is formed, a habit prevailing from the first hour the infant tries to articulate until he falls into the hands of a Kingsley. So there is a habit to be overcome, and a new one to be formed. You all know how difficult—oftentimes how extremely difficult—this is to do. How easy it was for this young man, getting out of our hands and back to his old associates, to drop into the old habit; and so in a short time, although he could articulate all these words perfectly, deliberately,—I don't mean with great fluency, but when he undertook to say Kellogg, Cazenovia, Syracuse, Kingsley, he did it perfectly,—from lack of care and practice he degenerated into his old condition. I do not despair of him yet. I shall correspond with him, and trust that I shall yet so stimulate his pride, his application, and his industry that he will play upon the skillful mechanism in his mouth to the rendering of as perfect speech as any of his peers in New York. After a thorough investigation of the case of the young man who with normal organs talked in many ways like his brother with cleft palate and velum, I became satisfied that it was purely a case of habit, formed by association with and imitation of his brother, and which may require years of care and labor to overcome. In pronouncing *C* hard, and *K*, instead of closing the velum as he elevated the tongue to contact with it, he would, by habit, depress the velum, thereby throwing most of the air through the nose,—splitting the sound and giving it a nasal and aspirate quality.

The habit of stuttering is oftentimes permanently formed by imitating the congenital stutterer. Chorea and insanity in various forms are often the result of the influence of example.

The following address was delivered by Prof. C. N. Peirce, D.D.S., Philadelphia :

MR. PRESIDENT AND GENTLEMEN OF THE NEW YORK ODONTOLOGICAL SOCIETY :

I very unexpectedly find myself announced upon your invitation cards to address you this evening upon "Materials for Filling Teeth," while all that I had intended doing was to give you as briefly as possible my experience in, or rather the results of my experiments with, the phosphate of zinc. To speak intelligently of the articles now in use for filling teeth and contrast their relative merits would necessarily involve a review of the various theories which have from time to time been advanced respecting the cause of this pathological condition, resulting in or contributing to the wide-spread and almost universal destruction of tooth-structure. The efficiency of a material, or its protecting properties, must vary very much with the quality of tooth-structure, the constitutional peculiarities or predisposition of patient, and the surrounding local conditions; the skill, or absence of it, with which the operation is performed must also have its modifying influence. The former of these subjects would undoubtedly open up for consideration much, both profitable and interesting, involving not only the question of food, but of habit of life, dwellings, occupation, location, inherited tendencies, etc.; materials for a higher and more intricate train of thought, embracing as they would some treatment looking towards the anticipation of disease and the eradication of the cause, instead of the mere temporary or palliative treatment which is included in the restoration of structures which have been partially or completely destroyed, and the modification of abnormal conditions. To do justice to this question as indicated in your card of invitation in an evening's essay would require more thought and care than can now be expended.

In pursuing my experiments with the view of finding some plastic material which would be an additional aid in the preservation of frail dentures, it was not that my confidence in the valuable properties of gold foil for the large majority of cases had been shaken,—the fillings of this material that have done good service for ten, twenty, or thirty years are too numerous for that,—nor yet that I had any hope of finding a material that would approximate its value in securing successful operations in the hands of the skilled workman.

Unfortunately, the law of limitation is stamped too conspicuously upon both patient and operator for us not to realize that in many situations this precious metal is thoroughly incompatible with a durable operation in the hands of the unskilled. It is also completely inadequate in many operations to supply the needs of a patient

possessed of an exalted nervous irritability with but moderate physical endurance; and by virtue of the necessary expense attending its use, many in limited circumstances are debarred from its advantages; while again we meet with teeth so frail, so poorly organized, surrounded by such unfavorable conditions, that, though gold be used with the greatest care and most artistic skill, the structures melt away from the filling as snow before a noonday sun.

These and many other considerations of a similar bearing have made a need that has been long and keenly felt by the dental practitioner, and one that the phosphate of zinc preparations will, to a large extent, I trust, supply. It is true we have already access to the various preparations of gutta-percha, oxychlorides of zinc, and amalgams. Each and all in special cases have had, and still have, their various uses; but a vacancy, broad and deep, welcomes the phosphate of zinc cements by virtue of their possessing the desirable qualities of easy mixing, and retention of plasticity sufficiently long for proper manipulation and complete introduction into the cavity; apparently neither shrinking nor expanding; non-conducting, non-irritating to the pulp; and thoroughly compatible with tooth-structure, giving no pain whatever to sensitive dentine. These and other qualities which they seem to possess must make their use a more important factor in the protection and preservation of sensitive dentine and exposed pulps, than has been previously supplied by any other white plastic material. Dr. Peirce then gave the formulæ of the preparations submitted and the manner of manipulating them and inserting the cement in cavities. The formulæ were published in the *DENTAL COSMOS* for December, 1879.

Dr. W. H. Atkinson. There is an affinity between chloride of zinc and the enamel tissues; and the knowledge of this affinity exists by virtue of the discrimination of a loved member of our profession now in this room. It was shown by him that protoplasm was an organized structure, that there was really a tissue that was properly named protoplasm. It is in the protoplasm that everything arises that grows in the human body, whether it be dentine, bone, or soft tissues. In discriminating the character of bone, we have to deal with the affinity that subsists between the elements that constitute protoplasmic granules and strings, or whatever you please to call the protoplasmic bodies in the human economy; and hence every pain you give has some kind of action that is exerted upon protoplasmic structure. Professor Peirce, in his address, said that cementum was more "*vascular*" than dentine. Neither of them is *vascular* in the sense we use the term vascular. If we say the protoplasmic strings in the uncalcified tracks of bone, cementum, enamel, and dentine are *vessels*, then that is correct, but not by any definition of the term

"vessels" that I have ever seen in any book or heard from any teacher before to-night. I think the doctor will correct his statement, that the action that takes place between any agent that holds an affinity for some of the elements of the protoplasm is arrested without being organized or disorganized.

We have been told this evening to use glacial phosphoric acid to obtund sensitive dentine. The most severe pain I ever saw in my life resulted from glacial phosphoric acid's being introduced into a cavity for this purpose. I tried it in two teeth in the same mouth, with the same result. The gentleman who has addressed us also said that fillings of his oxyphosphate of zinc had not deteriorated in any case, so far as he had seen. If he has seen fillings in the mouths of patients who have acid saliva, then I will take his testimony as concurrent with mine. But if he will show me fillings not deteriorated, that have been inserted three months in mouths with the saliva alkaline, he shall have the best dinner that Delmonico can provide. Alkaline saliva will dissolve every phosphate of zinc I have ever used. I have a lady patient who was desirous to have the upper front teeth filled at the necks and in the approximal face but who disliked the appearance of gold, and asked if something else could not be used? I used oxyphosphate of zinc. That was eleven or twelve months ago. I left the fillings a little full to see if there would be any waste, and in three months I found the fillings just even with the teeth. I have seen them within the last month, and they are excavated a little, showing that there is a process of gradual solution going on. But this material is capable of being used in a much more plastic condition than I used it. I like to use it as a very thick cream, so that when you have a ball on each finger, and cause them to kiss, they marry into one mass.

Dr. J. B. Rich. In all investigations into the properties of substances that pass from a fluid to a solid state, the laws that govern the process of crystallization ought to be thoroughly understood by the investigator. And as dentists use such substances for filling teeth, it is important that they should have a knowledge of those laws, and be governed by them in their manipulation of such substances when they are introduced as fillings. One of these laws teaches that during the process of crystallization, as the substance used approaches the solid condition, any disturbance of the mass at that time will prevent the proper formation of the crystals, and thereby destroy the integrity or strength of the solid formed by the crystallization of the fluid. Under the operation of this law we would be taught that one of the causes of failure, when such substances are used as fillings, is the over-manipulation when the filling is nearly solid; therefore the integrity of a filling made of the

substance presented to our notice to-night by Dr. Peirce would be destroyed if the manipulation should be carried on as long as the substance would yield to the pressure of the instrument. It is evident to me that many persons who take every precaution possible to have the conditions right when they use gold, are apt to neglect some of the necessary detail when they use plastic substances. Now, as some of these substances have very great merit as fillings under certain circumstances, the greatest care and attention should be given to all the detail when they are being used. Amalgam, which is one of those substances, and which is extensively used, is in a majority of cases introduced into the teeth in the most careless manner, and most of the failures with this material are due to this cause. It is often placed in a tooth under circumstances that render its success as a filling impossible, and in cases where a proper attention to the preparation of the cavity and the introduction of the amalgam would have insured success. The cavity is rarely prepared as it ought to be where the tooth is badly decayed and amalgam is to be used, whereas it ought to be prepared as carefully and the margin should be as strong as if the filling were to be made of gold. Yet amalgam is often introduced into cavities where more or less of partially decomposed enamel or dentine is left to form a part of the margin of the cavity. Where such conditions surround the filling success is impossible. I believe that seven-eighths of the failures of amalgam fillings are to be attributed to the careless manner in which the material has been used.

I have carefully made a number of comparative experiments with most of the amalgams that are prominently before the profession, to ascertain which of them is the best to construct fillings with, the proportions of mercury and alloy, and mode of manipulating them so as to produce the most desirable results, and I have found that the proportions of one grain of chemically pure mercury and four grains of the alloy made by Dr. T. O. Oliver of this city, with my mode of treatment, makes the best amalgam I know of, producing a filling that becomes very hard, with a remarkably strong, tough edge and fine, close texture that admits of the highest polish, and does not shrink or change color after it is inserted into the cavity. I am particular in mentioning the alloy I have found to be the best, as with any other the proportions I have named might not produce the best results possible.

Dr. Perry. Will you give us the method of preparing the filling?

Dr. Rich. The cavity ought to be prepared with the same care that would be employed if it were to be filled with gold; and as regards the margin, it ought to be more carefully prepared to meet the peculiar requirements necessary when the filling is to be made of amal-

gam. I will try and describe how it should be formed. For amalgam fillings the margin of the cavity should be made very strong, its lines should be even and smooth, and without angles. If angles exist, they must be formed into curves, and the inside surface of the margin, with which the amalgam will be in contact, must be made a continuous smooth line, so that the amalgam, when pressed against it, will have that form also, and be entirely free from raggedness; in other words, the wall of the cavity at the outside surface of the tooth must be so arranged that when the filling is finished there would be no shelving or attenuated edges or points to it, but a rectangular thick, strong edge. As yet there is no substance but gold that will bear an attenuated edge to the filling; amalgam certainly will not; but the cavity can always be so shaped that with the amalgam I use a strong, durable edge can be produced. This is a very important point in the use of amalgam, for many of the fillings made of it fail from the breaking of attenuated edges. On no consideration is any portion of decomposed substance to be left as part of the margin; such substance must be cut away, on the principle that half a tooth saved for usefulness is better than a whole tooth half saved. Before the amalgam is introduced the cavity must be made as dry as possible, and must be kept dry by a rubber or coffer dam. Where a rubber dam cannot be employed a coffer dam must be used, which can always be constructed so as to keep the moisture away from the cavity. After the dam has been adjusted the cavity should be packed two or three times with bibulous paper, and when it has been made as dry as possible by this means, place in the cavity a drop or two of absolute alcohol; the alcohol takes the place of the water that may saturate the surface of the structure that forms the walls of the inside of the cavity. When the amalgam is ready, the alcohol is removed by bibulous paper and the air-blast, leaving the cavity as dry as it can be made. The amalgam ought not to be mixed until the process of drying the cavity has progressed so far that the alcohol has been placed in it, which is to be left there while the amalgam is being mixed. To facilitate the accurate preparation of the amalgam I have sixty one-drachm vials, which number is divided into three divisions of twenty each; ten of each division contain alloy, and ten mercury, charged and ready for use; each one of those containing alloy in a division contains enough of that material, accurately weighed, to form, when united to the mercury contained in one of the vials in the same division, one filling of a certain size. Ten of the vials in the first division each contain four grains of the alloy, and each of the other ten contains one grain of mercury. Ten of the second division each contain eight grains of the alloy, while each of the other ten contains two grains of mercury. In like manner

the vials of the third division each contain respectively twelve grains of the alloy and three grains of mercury.

The vials ought to be shaped like a test tube, with the sides straight from the bottom to the top, without neck or shoulder, so that the material can be poured out easily.

The amalgam is prepared by pouring the alloy and mercury into the palm of the hand, which is covered with a piece of thin rubber; a very little mixing of these materials changes them into a lead-colored powder resembling sand; as soon as this condition is produced the manipulation ought to cease until the substance is introduced into the cavity, as in this state the crystallization will go on very slowly; when the particles of this powder are brought into close contact by pressure the crystallization will go on rapidly. A small portion of this powder is introduced into the cavity, and pressed and burnished with a suitable-sized instrument until the powder has become a layer of bright substance covering the bottom of the cavity and looking like burnished silver. Another small portion is introduced, and pressed or burnished down on the first layer, and thus a second layer is produced, and in this way a series of thin layers are formed until the cavity is filled. In cases where the cavity is so situated that the amalgam cannot be readily introduced in the form of powder, it must be formed into small thin disks; these can be very readily made in a wire gauge-plate, and must be made with as little pressure as possible, barely enough to have the particles hold together; when formed they are to be introduced into the cavity as soon as possible, crushed with the packing instrument, and then treated in the manner already described for the treatment of the powder. When the cavity to be filled is very large and the construction of the filling likely to take up considerable time, it is better to use the smallest quantities contained in the first division of vials and mix it often during the operation. The filling ought always to be formed in excess of what it will be when finished. A filling formed in the manner just described will be homogeneous in its structure, and will not leave the walls of the cavity during the process of construction.

At the last meeting of the society, something was said about the nerve broaches made by O. Johanson. Since that meeting he has, at my suggestion, made two new varieties, one of which has but one barb, and that very near the point, and another form without barbs, but with a very small portion of the sharp point bent at right angles to the shank; with the hook thus formed the very apex of the fang can be reached. He also tempers them to any degree desired, so that any amount of stiffness may be obtained. I consider them the best I have ever used.

While I am on my feet I wish to say a word or two in regard to

cases similar to the one described in the "Hints and Queries" in the November number of the DENTAL COSMOS over the signature of Cyrus See, D.D.S., in which the extreme sensitiveness of the nerves supplying the palate is described as producing nausea on the slightest provocation. I wish to suggest a remedy for such cases, which I have always found to be efficient. Two or three inhalations of nitrous oxide will do away with all difficulty in such cases, no matter how sensitive the palate may be, and enable the dentist to apply the rubber dam, take impressions of the mouth, or do any work about the parts without producing the annoyance described.

Dr. S. G. Perry. It is curious how operators differ in their methods, and in their fancies for instruments. I have tried to use the broaches Dr. Rich describes, but have not been able to get the same good service from them. I have thought them too slender and weak in the shank. I prefer a nerve instrument made of larger wire and having consequently greater stiffness in the shank. As there are none such in the market, I have for many years made them myself, following Dr. Edward Maynard's general plan of using Stubb's wire of large size, and filing them down to a gradual taper, and mounting them in light wood handles. When filed down to near the right size I rub a fine file across them lengthways to take out all cross scratches, and then polish by rubbing lengthwise between fine emery-cloth. Most of them I make and use without annealing or tempering. The tips of those that I desire to soften and render slightly less liable to break I carefully anneal; those that I want stiffer and slightly tempered I rub with a burnisher.

I make two sizes; one from wire of size 11, and one of size 17 of Brown & Sharpe's gauge-plate. Considerable filing is necessary to bring the largest one down to a delicate point, but it gives a stiff shank and beautiful taper. With such an instrument one has perfect control of the point, and, if mounted in a light wood handle, the sense of touch is greatly assisted. Remaining bent at any angle, such instruments are of great service in inaccessible canals. I cut only one or two barbs at the end. Sometimes I only bend the extreme tip at right angles, making an effective hook.

Dr. B. Lord. I wish to add my testimony to that of Dr. Rich's in favor of Dr. Oliver's amalgam. I have had a few months' experience with it, and so far I think it is the best I ever used. After the mixing it is very firm in texture, packs well, sets good, and retains a better color than any amalgam I ever worked. I use just sufficient mercury to hold the mass together as it is pressed or rolled by the thumb and fingers after the grinding in the mortar. I believe that the change that is spoken of as taking place in edges of amalgam fillings is due, mostly, to there being too much of the material used

in a given case. The cavity is filled overfull. The material is left over or on the edges, and that which is so left will often rise up or break away. I am satisfied that in using amalgam, as a rule, we should only fill the cavity flush, not allowing any of the material to overlap the edges; working it out of the depressions and irregularities of the margins as much as possible, and leaving the surface of the filling slightly concave. This should be particularly the case with crown cavities, leaving the surface of the filling to correspond with the natural masticating surfaces. Amalgam should be packed hard, using considerable force; and this will be found necessary if only the least amount of mercury that is required be used.

Dr. N. W. Kingsley. I also have been using from time to time for several months Dr. Oliver's amalgam, in which there is gold and platinum. The results have been so uniformly good that I do not hesitate to recommend it. It mixes well, works easily, makes a hard filling, and retains its color better than any I have ever found in the markets. Dr. Oliver gave me his formula, and I found it almost identical with that which I had made for my own use, and had used for some time before I obtained his, so that my experience with it may be regarded as covering a much longer period than that in which I have used his make only.

On motion, a vote of thanks was tendered to Professor Peirce for his able address, and for the very liberal spirit manifested in detailing to the society his mode of preparing the oxyphosphate filling.

Adjourned.

MASSACHUSETTS DENTAL SOCIETY.

THE annual meeting of the Massachusetts Dental Society was held December 11 and 12, 1879, at Boston, the president, Dr. L. D. Shepard, in the chair.

Dr. C. G. Davis, of New Bedford, delivered the annual address.

Essays were read by Dr. J. H. Kidder and Dr. Dwight M. Clapp.

The following resolutions were unanimously adopted:

WHEREAS, Serious charges against Dr. Geo. F. Waters, a member of the Massachusetts Dental Society, in connection with the death of Mr. Geo. A. Gardner, of Brooklyn, have been published in the papers of the country:

Resolved, That from the published reports and our own investigation, the Massachusetts Dental Society consider Dr. Waters entirely innocent of any unprofessional or injudicious conduct in this case, and that his treatment was wise, cautious, and safe.

Resolved, That the charge that Dr. Waters used arsenic in this case is entirely and wholly false. In such a case no man possessing the rudiments of a dental education would use arsenic.

Resolved, That the course of the *New York Times* in first publishing this sensational report without taking proper means to investigate the charges, is an out-

rage upon truth and the rights of citizens, and that its subsequent conduct in not making correction and reparation as far as possible was not fair and honorable, and, as this charge has seriously affected the business of Dr. Waters, by unjustly undermining the public confidence in him, we consider that that paper is pecuniarily liable for damages.

Resolved, That we know Dr. Waters to be one of the best-informed and most intelligent investigators in the profession, and entirely worthy the fullest confidence of the community.

The following officers were elected for 1880 :

President.—Dr. C. G. Davis, New Bedford.

Vice-Presidents.—Dr. Geo. F. Waters, Dr. C. H. Osgood, Boston.

Secretary, Recording and Corresponding.—Dr. W. E. Page, Boston.

Treasurer.—Dr. E. Page, Charlestown, Boston.

Librarian.—Dr. F. M. Robinson, Boston.

Microscopist.—Dr. R. R. Andrews, Cambridge.

Orator.—Dr. A. M. Dudley, Salem.

Executive Committee.—Dr. D. M. Clapp, Boston ; Dr. H. C. Meriam, Salem ; Dr. R. R. Andrews, Cambridge ; Dr. Charles Wilson, Boston ; Dr. D. G. Harrington, Boston.

W. E. PAGE, *Secretary*.

EDITORIAL.

DENTAL NOMENCLATURE.

SOME years since our attention was drawn to the conspicuous lack of uniformity among writers of papers for the DENTAL COSMOS, in the use of "proximal," "proximate," "approximal," and "approximate," as applied to the contiguous surfaces of adjoining teeth. Not only was there this diversity among different writers, but frequently an article would be offered in which two, or even three of the terms named were used, interchangeably in some instances; in others one form would be employed to express one idea, and another to convey a similar but slightly modified meaning, as though there was a shade of difference in their signification. Reference to the text-books in vogue in the schools supplied the key to this confusion of terms. The recognized authorities were as widely at variance as were our contributors. Taft and Garretson used "proximal"; Hitchcock (notes to translation of Wedl's "Pathology") and Arthur preferred "proximate"; while Harris, in both the older and later editions of "Principles and Practice," gave the weight of his sanction to "approximal," though, curiously enough, the word is not found in his dictionary. The authorities thus divided, it was not surprising that graduates of the schools should have no fixed name for contiguous surfaces. Obviously, intelligibility and precision of expression de-

manded that a single word whose force was clearly apparent should be used. Otherwise confusion would inevitably be produced in the minds of those not conversant with the subject. Especially would this occur when the writer of a paper held the mistaken idea before spoken of, that there were differences in the meanings of the four forms, and employed one or the other accordingly. The fact is, that properly used, these terms in dental nomenclature have a common significance. They are really, as we have called them, only different forms of the same word. So far as their primary signification is concerned, one is as applicable to the subject in hand as any of the others, and, were there no other considerations, the choice of a standard might readily be reduced to the selection of the simplest form.

It was manifestly desirable that uniformity of usage should obtain in the DENTAL COSMOS, in order that it might be free from a needless and, as has been shown, highly objectionable multiplication of terms. It was therefore thought proper to definitely adopt one of the four forms for its pages; to take that which, while conforming to good usage as expressed in some one or other of the dental authorities, seemed least objectionable for any reason.

"Approximate" was early left out of the discussion, as although one of its definitions is, "arranged in the jaws so that one passes on the side of the next with no intervening vacancy,—said of the teeth,"*—which would seem to settle the validity of its use in the sense in which dentists employ the term; on the other hand, it had received so little countenance from recognized authorities that it was thought doubtful policy to adopt it, especially in view of the following facts: In its primary signification, "next, nearest," according to Webster, it has been superseded by "proximate"; while the principal use to which "approximate" as a qualifying adjective is put is in chemical and mathematical technology, in such phrases as "approximate analysis," "approximate value"; and even in this sense it is quite common among later authors to find "proximate" used in its stead.

"Approximal" also was passed, because it was not found in either of the standard dictionaries (Webster, Worcester), or in the medical dictionaries of Dunglison, Thomas, or Harris, although its employment by Harris in his text-book must have been known to the compilers of the later editions of at least some of them. Whatever claim to recognition may have been conferred by Harris's use of "approx-

* It may be noted that the phrase is, "said of the teeth,"—that is, the *teeth* are "arranged in the jaws so that one passes on the side of the next;" which *might* preclude the limitation of the word merely to their adjoining surfaces.

imal" in "Principles and Practice" was nullified by his neglect to incorporate it in his dictionary, which was professedly a dictionary of dental terminology, and should therefore have included all approved dental terms. To this oversight probably is due the fact that it does not appear in the other dictionaries. If its use had been sanctioned by the authorities named, "approximal" would probably have been chosen, as having the advantage of agreeing in termination with the kindred terms labial, buccal, lingual, palatal, mesial, and distal. But having no assured status it was rejected, our object being simply confirmation of established good usage.

"Proximal" had the same advantage of terminal agreement possessed by "approximal." The fatal objection to it was that it had long before been appropriated in medical nomenclature, and had a recognized anatomical significance. "Thomas's Medical Dictionary" says, "Proximal (from *proximus*, the nearest). Applied by Dr. Barclay as meaning towards the end nearest the trunk, when treating of the four extremities." "Proximal," according to Webster, means "toward or nearest, as to a body or center of motion or dependence; proximate; as, the proximal tuberosities of a bone." This is substantially Barclay's definition given above.

"Proximate," according to Worcester, signifies "next in the series." We quote Webster's definition entire, as showing the derivation of all the forms under discussion. "Proximate, *a.* [Lat., *proximatus*, p. p. of *proximare*, to draw or come near, to approach, from *proximus*, the nearest, next, superl. of *propior*, nearer, and the obsolete *propis*, near.] Nearest; next immediately preceding or following."

The teeth undoubtedly form a series. When a "proximate" surface is spoken of reference is made to a mesial or distal surface contiguous to another tooth. "Proximal" surface is but another and unnecessary name for distal surface, since the anatomical significance is "towards the end nearest the trunk, or toward or nearest the body or center of motion." Thus the distal surface of the third molar is "proximal," though it cannot properly be called "proximate." On the contrary, no mesial surface can be called "proximal," though it may be "proximate."

For the reasons given "proximate" seemed most desirable for dental purposes, and it was therefore adopted as the standard for the DENTAL COSMOS. Recently, however, our practice has been questioned by some who have expressed a preference for "proximal," probably without consideration of its anatomical definition. With the view of receiving an authoritative opinion we laid the matter before the eminent philologist, Joseph Thomas, LL.D., author of "Thomas's Medical Dictionary," and various other works, requesting the expression of his views on the subject. Below we print his reply:

" PHILADELPHIA, Nov. 14, 1879.

" DEAR SIR,—In regard to the subject to which you called my attention at our last interview, I would say :

" Every true scientist will admit that in scientific statements or descriptions precision or exactness of language is of the very first importance; for without precision of language it is impossible to impart exact and accurate knowledge. It is not enough that the words employed should convey a tolerably correct idea to one who is already acquainted with the subject; they should be such as would not be likely to mislead or confuse the uninitiated. It is therefore eminently desirable to use terms which have but one scientific application. It would certainly, in scientific language, be in the highest degree objectionable to use the same word in two *entirely distinct* significations; to use, for example, 'proximal' in its ordinary anatomical acceptation, and also for the purpose of indicating those surfaces of the teeth which are presented to each other.

" The same objection, though in a far less degree, might perhaps be urged against the use of 'proximate' in the signification just referred to; but I am not aware of any other scientific application which would be a serious objection to its use in such cases.

" But there cannot be the slightest objection to employing the term 'approximal' for such a purpose. The fact that it is a new word is in my opinion a very strong point in its favor; for there need be no dispute about its proper use, and it can readily be limited strictly to one signification. That it is not found in Webster's or Worcester's dictionary ought not to have the weight of a feather against it. Every one who has given the slightest attention to the subject must know that there are hundreds of scientific terms which are contained in neither of those dictionaries, but which are nevertheless employed by scientific writers of the very highest reputation. There can be no objection to new terms, provided they are really needed for the purposes of science, and are formed in a legitimate manner. New terms are being continually introduced into chemistry, physiology, biology, etc., as new substances or new relations between things already known are from time to time discovered, with the progress of those sciences. Why should dental science be denied a privilege or an advantage which is granted to all others?

" I fully agree with you that it is extremely desirable that a single term should be employed for the particular purpose in question. For it could not but tend to confusion if one writer should use 'proximal,' another 'proximate,' and another 'approximate' or 'approximal' to indicate one and the same thing. As it would be perplexing or confusing to use the same term in several different significations, so it would be, though in a less degree, to employ several different terms to express one and the same idea.

" I would say, in conclusion, that I deem it not a small recommendation of 'approximal' that it corresponds in termination with so many other dental terms denoting position or relation, as mesial, distal etc.

" Very respectfully yours,

" JOSEPH THOMAS.

" To DR. J. W. WHITE."

We therefore suggest and recommend, for the reasons named, the adoption by the profession of the single word "approximal," to be used in denoting the contiguous surfaces of adjoining teeth. Our pages are, however, open to any proper discussion of the subject, our only desire being to secure a uniform use of the best word.

BIBLIOGRAPHICAL.

BRAIN-WORK AND OVERWORK. By Dr. H. C. Wood, Clinical Professor of Nervous Diseases in the University of Pennsylvania, etc. Philadelphia: Presley Blakiston, 1880.

This, the eighth of the series of American Health Primers, is devoted to subjects which, though of interest to all, men and women, especially concern professional men and those engaged chiefly in brain-work and in-door occupations. It treats of nervous diseases, their causes and symptoms; of eye-strain and brain-strain; of exposure; of sexual and other excesses; of eating and drinking; of alcohol, tea, coffee, and tobacco; of emotional disturbances; of intellectual labor; of time and variety of work; of exercise and recreations; of vacation; of sleep; of stimulants, their use and abuse, etc. The various topics are discussed temperately and wisely. Indeed, the apparent absence of prejudices and partisanship in the expression of the author's opinions is so different from the *ipse-dixit* style of most writers on such subjects, that the judicial handling which they receive is positively refreshing. The hygienic surroundings and training of children are discussed with much sagacity, and the relation of the subject to the production of dental irregularities entitles the counsel given to the special consideration of dentists. We are very sure that a careful perusal of this little volume will amply repay either the professional or the lay reader. Indeed, it would be difficult to say where more common sense can be found in the same space.

OUTLINES OF THE PRACTICE OF MEDICINE, with Special Reference to the Prognosis and Treatment of Disease. With appropriate Formulæ and Illustrations. By SAMUEL FENWICK, M.D., Lecturer on the Principles and Practice of Medicine at the London Hospital, etc. Philadelphia: Lindsay & Blakiston, 1880.

In this volume another attempt has been made to "crowd Olympus into a nut,"—to give within the scope of less than 400 pages a compendium of the theory and practice of medicine. The plan of the work is, however, unique, and possesses many advantages. The aim is not to present a detailed routine of practice in the diseases treated of, so much as to give concise general rules applicable to the treatment of disease in all its forms, with their special application to the various pathological conditions considered. Reference to these is rendered easy by a lettered arrangement throughout the volume. It is not intended by the author that the study of this volume shall form a sufficient preparation for the practice of medicine, but that it shall serve a useful purpose in enabling the student to prepare for his ex-

amination; to recall the more elaborate teachings of the chair of practice and the clinical instructions of the hospital. As a reminder of the principles involved in the diagnosis and treatment of disease, as well as of the remedies indicated, the volume may be advantageously consulted, not only by the student and recent graduate, but in many cases by even the well-informed practitioner. We commend the work as most admirably adapted to the object for which it was prepared.

OBITUARY.

ACTION OF THE DENTAL PROFESSION WITH REFERENCE TO THE DEATH OF DR. SAMUEL S. WHITE.

THE DENTAL PRACTITIONERS OF BALTIMORE.

At a meeting of the dental practitioners of Baltimore, held at the Baltimore College of Dental Surgery, Tuesday evening, January 6, 1880, Drs. F. J. S. Gorgas, T. S. Waters, and A. P. Gore, the committee appointed to draft resolutions relative to the death of Dr. Samuel S. White, reported the following, which were unanimously adopted:

Whereas, The dental practitioners of Baltimore City having been called together to pay a tribute of respect to the memory of the late Dr. Samuel Stockton White, of Philadelphia, whose death may be regarded as both a professional and public loss: Therefore be it

Resolved, That the dental practitioners of Baltimore City have learned with deep regret of the death of one who has been for many years closely identified with the Dental Profession, at that period of life when the mental powers are in their fullest vigor, when his honorable career as an enterprising business man had won for him a world-wide reputation, and whose personal qualities, as exemplified in every relation of life, had secured the warm attachment and high respect of a large circle of devoted friends.

Resolved, That the dental practitioners of Baltimore City fully recognize the obligations American Dentistry owes to the late Dr. S. S. White through the active agencies he has awakened for the elevation of the science, his devotion to its interests, and the zeal, energy, and intelligence he displayed in useful inventions and dental literature.

Resolved, That this expression of appreciation of the worth of the late Dr. Samuel Stockton White, in the form of a copy of these resolutions, be transmitted to the bereaved family of the deceased, and that they also be published in the different dental journals.

Professors Gorgas and Winder, on the part of the faculty of the Baltimore College of Dental Surgery, and Dr. H. H. Keech, on the part of the dental practitioners of Baltimore City, were appointed to attend the funeral in Philadelphia.

FIRST DISTRICT DENTAL SOCIETY.

At a meeting of the First District Dental Society, held January 6, 1880, at the residence of Dr. C. F. W. Bödecker, 73 West Forty-fifth Street, New York,

Dr. Wm. H. Atkinson moved that a committee be appointed to express the sentiments of the society on the demise of our beloved friend and co-laborer, Dr. Samuel S. White, of Philadelphia, Pennsylvania. The vote prevailed, and the president appointed Drs. Wm. H. Atkinson, Geo. A. Mills, and C. F. W. Bödecker, with whom, at their request, was associated Dr. C. E. Francis, with power to publish their report in the *DENTAL COSMOS*. The following is the report of the committee:

In the effort to record our estimate of the character and career of him whom we mourn, words are but poor vehicles of expression of our appreciation of his qualities as a man and the great leader of dental progress.

It is our deliberate conviction that he had no equal in the earnestness and high-toned purpose and ability for the work done in helping to higher means and better methods in the Dental Profession.

It is well known that at the time he engaged in the effort in this direction there was no Dental Profession worthy of the name, and that through the blessed inspirations he so faithfully followed he contributed more to this end than any other man however zealous.

We feel it to be our great privilege to bear this testimony to his transcendent worth, and to do all in our power to continue and further the noble purposes conceived and carried forward by him.

It is within the knowledge of your committee that his ambition to become the great leader he has proved himself to be arose from his devotion to the purpose for which he believed himself sent by Him of whom we are, and whom we should obey. Although we are deprived of the help of his ripe counsel and the benediction of his physical presence, yet may not we joy continually in the rich fruitage to be garnered in the oncoming years, growing out of his faithful, efficient, and loving labors. The love we bore him will not allow us to omit offering our sincere condolence to his exceptional family, and to join our sympathy with the many members of the Dental Profession whom he so signally helped to attain their present advanced status.

Resolved, That this report be recorded in our minutes, and a copy be sent to the *DENTAL COSMOS* for publication.

G. W. WELD, *Secretary*.

ALUMNI ASSOCIATION OF THE PHILADELPHIA DENTAL COLLEGE.

At a late meeting of the Alumni Association of the Philadelphia Dental College a tribute of respect was paid to the memory of Dr. Samuel S. White, as follows:

In giving expression to our feeling for our lamented friend, Dr. Samuel S. White, we may characterize him as a man among men, combining a life of usefulness and completeness in every detail, and possessing kindness of heart

coupled with a generous liberality as his leading characteristics. His death we feel to be, both publicly and privately, a serious loss.

To the Dental Profession he gave of his time and of his means—nay, even life itself—for its advancement, and his memory will long be cherished by it as a friend and benefactor.

To his sorrowing family we offer our deepest sympathy for the loss of an affectionate husband, a loving father, and an upright man.

J. LEHMAN EISENBREY,
J. P. WYMAN,
L. ASHLEY FAUGHT,
J. N. WUNDERLICH,
D. NEALL McQUILLEN,
CHAS. E. GRAVES,
Committee.

CHICAGO DENTAL SOCIETY.

At a meeting of the Chicago Dental Society held January 5, 1880, the following resolutions were passed:

Whereas, The painful intelligence has just reached us that Dr. Samuel S. White has, with appalling suddenness, taken leave of earth and earthly things: Be it therefore

Resolved, That in his death the nation has lost one of its most energetic, useful, and upright citizens, and that the Dental Profession has been bereft of its noblest benefactor and best friend,—one who in the prosecution of his extended enterprises advanced the Art, and by his liberality fostered the Science of Dentistry.

Resolved, That this society is especially indebted for the many kind favors which he has bestowed upon it from its first organization up to the present time; and that its members deplore his loss, both as a personal friend and as a gentleman who has been ever true and generous to the profession of his early adoption; and that we will cherish his many noble qualities in ever-grateful remembrance.

Resolved, That we extend to his bereaved family our most sincere and heartfelt sympathy for the great affliction which they have sustained.

M. S. DEAN, *Corresponding Secretary.*

HERMANN ROTTENSTEIN, D.D.S.

DIED, at Frankfort-on-the-Main, Germany, August 13, 1879, HERMANN ROTTENSTEIN, D.D.S., in the forty-seventh year of his age.

DR. ROTTENSTEIN was a graduate of the Pennsylvania College of Dental Surgery of the class of 1859, and commenced the practice of dentistry in Frankfort-on-the-Main in 1860. He was appointed Court Dentist of the Duchy of Nassau in 1862, and of the Grand Duchy of Hesse in 1874; also Royal Court Councillor of Saxony in 1874, and Royal Prussian Court Dentist in 1876.

MR. JOHN SMALE.

WITHIN a year we announced the death of Mr. Henry Smale, senior member of the firm of Smale Brothers, dealers in dental supplies, London, England. We have now to record the death of his brother, Mr. John Smale, on December 11, of acute bronchitis, after only a few days' illness. Mr. Smale was a gentleman highly respected and esteemed, and his decease is the occasion of deep regret among a large circle of business and personal friends.

JOHN CLOUGH, M.D.

THE American Academy of Dental Science at the monthly meeting held in Boston, December 3, 1879, adopted the following resolutions:

It having pleased an all-wise Providence to call from the scene of his earthly labors and usefulness our esteemed fellow-member, John Clough, M.D., of Woburn, Massachusetts: Therefore

Resolved, That the American Academy of Dental Science has heard with deep regret of the decease of our worthy friend and associate, Dr. John Clough, who, as one of the old practitioners of dentistry in Boston, for more than thirty years faithfully upheld the honor of the profession.

Resolved, That in the death of Dr. Clough the academy has sustained the loss of one of its most zealous members, dental science an earnest and intelligent advocate, and the community an excellent and useful citizen.

Resolved, That we accord to his memory this heartfelt tribute of respect, and tender to his surviving family our condolence and sympathy in their heavy bereavement.

Resolved, That a copy of these resolutions, signed by the president, vice-president, and secretary, be presented to the family of the deceased, and a copy be entered upon the records of the academy and published in the dental journals.

CECIL P. WILSON, *Corresponding Secretary*.

PERISCOPE.

ON AFFECTIONS OF THE EAR ARISING FROM DISEASES OF THE TEETH.—Some time ago the writer was so much impressed with the frequent co-existence of aural and dental diseases in many of the patients who came to him with the former affection, that he resolved to assume the task of recording the results of any subsequent observations on the subject.

A carious tooth, that seemed to arrest the favorable progress of an acute otitis media purulenta, was the means of first attracting my attention specially to the teeth as bearing a more important relation to aural diseases than I had previously supposed; and, although the thought was not entirely new to me, nor yet original, the impression

thus made by a single striking case was the occasion, subsequently, of more thorough examinations of the mouth in all cases being made.

On now reviewing the records that I have since kept of some fifteen hundred cases, I find that the teeth are more frequently the seat of disease than was at first suspected, for of these fifteen hundred aural cases, perhaps one-third owe their origin or continuance, in a greater or less degree, to diseases of the teeth. . . .

The more recent works, especially of Woakes and Cooper, give considerable space to this subject. Regarding the physiology of the nervous relationship, the treatise of Dr. Woakes more clearly establishes it than has hitherto been done.

Since physiological research has drawn attention to the fact that vaso-motor relations create instantaneous communication between parts widely separated—as between the teeth and the ears—we are enabled to make a more satisfactory diagnosis, especially as to etiology, in aural disease, and to establish a more rational system of therapeutics.

Treatment, based on the belief that the ear is nearly always invaded by disease extending from the throat *per* the Eustachian tubes, will, it is believed, give place to more successful methods, because founded on a more rational pathology.

The phenomena whereby affections of the teeth excite diseased action in the ears cannot be better explained than by a reference to the formula of Dr. Woakes: it reads,—

“The only obvious connecting link between the regions interested is the continuity of nerve-fiber. The simple continuity of sensori-motor nerves is insufficient to produce the conditions under review; we must seek yet farther for the true medium by which they are brought about. This will be found in the relations of the vaso-motor nerves, and the functions which it is their office to fulfill.”

He believes that nearly all sensori-motor nerves comprise fibers belonging to the vaso-motor system, and that these fibers run in a contrary direction to the cerebro-spinal nerve with which they are associated. . . .

Although the trigeminus and eighth pair of nerves, together with the sympathetic, bring into intricate relationship the buccal and pharyngo-nasal cavities and the ears, an anatomical description of their distribution would lead me too far. It is difficult to believe that any considerable lesion of these regions can long exist without affecting the ears (and, indeed, the eyes), and even more remote regions than those mentioned are frequently brought into sympathetic relationship with these organs of special sense, as daily clinical experience proves.

Having presented this statement of the generally accepted theory of vaso-motor action, I shall now bring forward some of the diseases of the teeth that are commonly concerned in giving rise to sympathetic aural disease. The general surgery of the jaws, including the pathology of the subject, does not concern us as much as the minor diseases which are more likely to be neglected. It must here be confessed that, as a profession, our knowledge of the diseases of the teeth, gums, etc., is not what it should be. The teeth, which were once universally regarded as lifeless objects, are still treated by

the profession in general without a due regard to the influence they exercise over the health of the individual.

It was not until the beginning of this century, when John Hunter, Fox, and others laid the foundation of their true pathology, that the teeth were treated on a scientific basis. Within the present decade Wedd and others have brought the pathology of the teeth up to the standard of modern requirement. The apathy which has always existed on the part of the profession regarding this subject has left the treatment of diseases of the teeth in the hands of men who have occupied themselves almost exclusively with its mechanical department, and who, as a rule, have but little to do with the teeth in a medical aspect. It is greatly to be regretted that a field of such interest has been abandoned by the profession. Many affections of the teeth lead to most grave and intractable diseases of the regions presided over by the sympathetic system, which are often suffered to be long unattended before they are brought under appropriate management. Thus an ear, eye, or throat difficulty may become firmly seated, or a neuralgia, which renders life intolerable, established. When I look back at the operation for the removal of Meckel's ganglion, which I twice witnessed, for the relief of facial neuralgia, it occurs to me that the most simple of remedies could have controlled that disease when it was first induced, as was probable in these instances, by a carious tooth.

The teeth are a prolific source of nervous diseases for sufficient reasons; their development and decay, ill-usage by improper foods and drinks, the unhealthiness of the saliva, the lack of cleanliness, etc., are all sources of greater or less irritation. The mouth, moreover, being richly supplied with nerves and blood-vessels which are distributed to its extensive mucous membrane, is highly sensitive to all of these influences.

The ear begins to suffer from sympathetic dental irritation from the time of the appearance of the two central incisors of the lower jaw, which are cut at about the seventh month, until the completion of the first dentition, which is usually before the end of the second year. The gums may become alarmingly swollen during this eruption of the milk-teeth, and in some rare instances periostitis of the jaw occurs. . . .

Catarrhal affections of the buccal cavity and of the naso-pharynx are at this period of common occurrence, and increase the dental irritation.

Caries of the milk-teeth is frequently met with, and a very considerable number of children have toothache from this cause. The irritation in the infantile mouth from the causes above enumerated creates more or less sympathetic hyperæmia of the ears before attention is directed to that region by earache. It is, therefore, generally found that a purulent otitis media has been established before the physician is called, and not infrequently great deafness already exists, the amount being difficult to estimate at this age, but in some cases it is sufficient to establish deaf-mutism; indeed, the latter frequently occurs from non-purulent affections which produce changes in the conductive apparatus that are unrecognizable by an examination *per* the external meatus. I think but few aural catarrhs of infancy have not been preceded by the hyperæmia of first dentition.

The instances of grave cerebral irritation from cutting the milk-teeth are quite common, and tend to complicate the diagnosis of acute aural disease. . . .

Aural affections that have arisen from the sympathetic irritation of the first dentition are, in many instances, no sooner cured than they are again aroused into sudden activity by the cutting of the second teeth, the eruption of each tooth being the signal for an earache and otorrhœa. . . .

A short time ago opportunity was afforded me to examine the aural cases in a large charitable institution containing children of both sexes who were almost exclusively within the period embraced by second dentition. About six per cent. of the inmates were found to have otitis media purulenta, or were the subjects of earache. (I doubt not the actual number affected with aural disease was far greater, for only those reported who had earache or offensive discharges.) The examination of this group of over thirty children, where second dentition was active, impressed me more than any previous observations on individual cases. In some of these cases there was earache and toothache at the same time, while in others the exact location of the pain could not be determined. The condition of the teeth of these children afforded an instructive study of this subject; in all of them some anomaly was found to exist; either the eruption of the teeth themselves had greatly irritated the gum, and this was especially the case where fragments of the coronary substance of the milk-teeth still remained attached to the gum, or the second teeth were irregular or carious. A general catarrhal condition of the mouth, aggravating all the above conditions, was commonly present.

During the first and second dentitions, it may be stated incidentally, the mouth has but little rest. The whole of the period of the first is frequently an uninterruptedly painful process, which is rapidly followed by the steady advance of the second teeth, whose early decay is imminent. To this can be added the irritation of adherent fragments of the milk-teeth, and the not infrequent anomalies of development, neglect of cleanliness of the mouth, and the presence of abnormal saliva. Affections of the throat, nose, and other parts, when present, increase all of these difficulties. The ear is particularly liable to attacks of catarrh when hyperæmia exists from any cause, and there are but few persons who pass through the period of childhood without having at some time experienced from this source an earache.

The general health, moreover, can scarcely fail to suffer from this local irritation, as well as from the imperfect assimilation that arises from the difficulty experienced in the mastication of food.

The appearance of the third molar, or wisdom-tooth, is very frequently the source of grave aural affections, and if the ear be found in a diseased condition when its eruption begins, there will be an aggravation of the malady. Prosopalgia, abscess, and even necrosis of the jaws, are very often developed by this irritation. The difficult eruption of this tooth, which comes through the gum between the eighteenth and thirtieth years, is owing mainly to the density of the alveolus and covering membrane, which at the late time of its appearance resist penetration.

Malposition of the wisdom-tooth from anomalies of the germ is of

occasional occurrence, and when from this cause it occupies a horizontal or oblique position in the jaw, and is, in cutting, urged onward against the second molar, irritation results. In these cases the grinding surface of the wisdom-tooth presses against the root of the second molar, causing greater or less neuralgic pain. Insufficient length of the jaws, especially of the lower one, occasions crowding, and obstructs the eruption of these teeth. In numerous instances the inflammatory action is not confined to the teeth, but the connective tissue as far as the pharynx is involved. Dr. Abbott (MS. communication) relates two cases where phlegmonous inflammation proved fatal by asphyxia, and another, in which the abscess in the pharynx was ruptured by the patient, who violently grasped his throat to escape suffocation. Immediate relief was thus obtained, and ultimately he recovered. In this case the offending tooth, together with the first and second molars and the two bicuspsids of the same side, with their alveolar attachments, were lost by necrosis.

At the present time a patient, aged twenty-four years, is under my care, who had a mild attack of aural inflammation from sea-bathing; the membrane not clearing up, as I was accustomed to witness, a more close examination of the mouth was made, when it was discovered that a superficial abscess had formed over the left lower wisdom-tooth of the same side. Closer inquiries elicited the fact that this tooth had been a source of more or less irritation for a year or two. Upon its removal the gum slowly healed, and the aural symptoms began to improve.

Another case has just been seen by me, that of a lady, aged twenty-one years, who has gradually lost her hearing during the past eighteen months, and can now only hear shouting. For more than a year past earaches have been frequent, and the tinnitus aurium was so distressing that her rest at night was much broken. The membranæ have become atrophied, and retraction has taken place. Examination shows the cause of this state of things to depend on the irritation of both the lower wisdom-teeth that penetrated the gum with difficulty. Her upper wisdom-teeth can be felt emerging from the maxillary tuberosities of the superior maxillary bone, and from her former experience trouble from their eruption is anticipated. . . .

The irritation in the jaw occasioned by this tooth is very apt to be soon felt in the ear, and the hyperæmia thus occasioned in the external meatus or drum-head may easily mislead as to the real cause of the difficulty.

Should the throat be involved, as indeed it is likely to be, in these cases of difficult dentition, the sympathetic action in the ears will be found to depend also on influences other than the irritation of the dental filaments of the fifth nerve, for the pharyngeal and tonsillar branches of the eighth cranial nerve will bring the throat into direct relationship with the sympathetic system through which the ear is affected.

Severe aural irritation long continued may establish an inflammation, the etiology of which will be obscure, especially if the patient has been exposed to well-recognized causes of aural disease, unless the part taken by the teeth be kept in mind.

However important the aural affections from the first and second dentitions may be regarded, they are equaled by those arising from

diseases of the teeth subsequently. These affections of the ear in youth are nearly always of a painful nature, while, on the contrary, in those of later years that symptom is more likely to be absent.

The pain of the teeth, which we familiarly associate with their inflammatory condition, is signally absent in many of their affections, and it is to the absence of this symptom that their chief danger is attributable. Clinical experience has furnished me with numerous examples illustrative of this fact, where most extensive and destructive diseases of the teeth, gums, etc., were wholly unrecognized by the patient until his attention was drawn to them as the cause of tinnitus aurium and deafness. . . .

A case has just passed out of my own hands which has an interest in this connection; a child was suffering from an earache, the cause of which was not apparent until an examination of the mouth showed that the aural difficulty had its origin in the irritation produced by a fragment of enamel, left behind by a milk-tooth, that was wedged in the gum along the side of a newly-cut molar. The membrana tympani in this case was decidedly inflamed. The removal of the foreign substance from the gum, however, cured the disease. . . .

There are a great many persons who lose many or all of their teeth from caries without experiencing any pain, but who, nevertheless, seem to have reflex irritation affecting the ears all the same. These cases are frequently most grave as regards the incurable deafness resulting, because of the painlessness of the dental disease as well as of the long-continued aural hyperæmia thus excited. . . .

Irritation from concealed roots, left on extraction, or after decay of the rest of the tooth, is frequent, and from this source neuralgias arise in which the ear participates in numerous instances.

Hypertrophies of the teeth and alveolar processes are a common result of continued irritation of the dental nerves. Those of the periosteum of the root are, perhaps, the most common. These proliferations (exostoses) of the teeth may augment the size of the roots affected to several times their normal growth; they are more frequently found on the bicuspid and molars than other teeth; they are of slow development and give rise to painful neuralgias. A case is reported in the *Quarterly Journal of Dental Science*, 1857 (cited by Wedl), by J. L. Levison, where death ensued from this cause, the irritation of the exostosis exciting inflammation of the membranes of the brain. Tomes ("System of Dental Surgery" cited by Wedl) reports two cases of epilepsy arising from exostoses of the teeth.

Abbott (MS. communication) reports the case of a lady, aged sixty years, who suffered greatly from neuralgia for ten years, during which time she had two operations performed (division of dental nerves) without benefit. The removal of a tooth having on its root an exostosis gave entire relief.

In another case all the molar teeth were removed from the upper jaw of a lady for neuralgia, and were all found to have hypertrophied roots. It is noted as of interest in this case that the teeth were all sound and had antagonizing teeth. . . .

This most superficial presentation of some of the affections of the teeth scarcely serves as an introduction to the interesting pathological field to which so many aural diseases owe their origin, but it

is hoped that from what has been brought forward a better knowledge of the etiology of aural diseases may finally be obtained.

From a careful study of some of these affections I have thus been led to the conclusion that they may arise from causes not indicated by the accepted etiology: such are diseases of the meatus auditorius externus, known as seborrhœa, obstructing accumulations, diffuse and circumscribed inflammations, and inflammations of the middle ear.

Any treatment of these affections, based on local symptoms alone, will frequently be unavailing, and success can hardly be assured without attention being given to their true causes. A familiar illustration of the *modus operandi* of the above-mentioned affections of the meatus is witnessed where the nervi-vasorum supplying the vessels that go to this region connect by their filaments through some of the sympathetic ganglia with the nerve coming from a diseased tooth. The result of the irritation of the dental filament of the fifth pair is a transmission of the irritation along the nervous route thus established to the ear, where vessel dilatation takes place. The vessels going to supply the meatus are thus distended beyond their normal state, and congestion, acute or chronic, takes place. Pain in the tissues is then experienced as a result of an acute attack, or on the other hand, where chronicity is the condition, pain is less marked. We have here to do, probably, with the reflex irritation conveyed to the anterior auricular branch of the temporal artery in its ramifications on the walls of the meatus auditorius externus with resulting hyperæmia of the part. One sequence of active hyperæmia may be diffuse inflammation of the meatus; another may be circumscribed inflammation, or chronic hyperæmia may exist, resulting in an unusual secretion of cerumen. The latter condition remaining active for a longer period of time, the meatus may be completely occluded by the hypersecretion, and intermittent periods of excitation will most likely be attended by exfoliations of epithelium, which give rise to ceruminous plugs of alternate layers of epithelium and cerumen, a transverse section of which will possess the characteristic annular appearance of an exogenous growth. When a furuncular inflammation is the consequence of this vaso-motor action the stage of hyperæmia has, of course, been passed, and we have to deal with a true inflammatory process, the persistency of which is well known.

The treatment of these boils in the ear is less likely to be unsuccessful when their remote cause is ascertained. Hyperæmia thus induced in the external auditory meatus by reflex action frequently manifests itself by a slight increase of the normal ceruminous secretion, or by an itching with a desire to scratch the parts; or there may be a distressing feeling of formication deep in the ears.

The fact that the conductive apparatus in many of these diseases of the meatus is but little affected seems to strengthen this hypothesis of their origin, for the tympanum receives its principal blood-supply from the tympanic branch of the internal maxillary and the stylo-mastoid branch of the posterior auricular, sources independent of the vascular supply of the meatus. It is quite unlikely, however, that any serious aural trouble can long exist in any given region without neighboring tissues being more or less involved.

It is a significant fact, worthy of mention in this connection, that

the sympathetic aural affections of infancy and youth are principally confined to the middle ear, and it should be borne in mind that the entire nervous distribution for the milk-teeth, together with their alveoli, etc., give way to another development belonging to the teeth that are destined to be permanent. . . .

Artificial teeth are worn by an exceedingly numerous class, and it is believed that the health of a large number of these people is imperiled by the material used in the construction of plates, as well as the methods of fitting them to the mouth. This subject, therefore, has an interest which concerns the profession at large, as well as the specialist. . . . It is probable that the demand for cheap dental work has led to the more frequent employment of these injurious substances. These plates are frequently put into the mouth over carious roots, inflamed gums, and collections of tartar, completely incasing them, and retaining the foul secretions and decomposed particles of food usually present. The ingress of air or cooling liquids is prevented under these circumstances, and the decomposition of the retained fluids, etc., is thereby favored. . . .

Plates are constantly found in the mouth as described above, without pain or apparent inconvenience to the wearer, owing to the tolerance acquired by long use. That septic poisoning may occur under such favoring circumstances is possible, for the diseased tissues are frequently bathed in pus.

That we should find this state of things common among the uninformed is not a matter for surprise, but the neglect which the subject has received at the hands of the profession is to be regretted. It would be impracticable to bring forward here the numerous cases where, from a want of proper knowledge of the subject by both physician and dentist, permanent injury to the patient has resulted from wearing unsuitable plates in the mouth.

One instructive case, however, may be related with advantage, where the victim was a physician under my own observation. He had worn in his mouth for six years a gold plate supporting two upper incisor teeth. The plate seemed to be satisfactory in every way, when the wearer, finding his breath becoming very foul, applied to a dentist to have removed any tartar that might have accumulated on his teeth. Tartar was only suspected to exist on the lower incisors, but the dentist, who in this instance was also a physician, thought it well to explore the whole mouth, when, to his patient's surprise, he found the gum to be partially detached from the lingual surface of all the upper teeth, the denudation extending down the teeth a distance of from five to seven millimeters below the gum. The origin of the foul breath was now discovered to be the ulcerous condition of the separated gum, the retained pus soon becoming decomposed. The denudated fangs were slightly coated with tartar. The patient now recalled to memory the fact that for more than a year he had experienced tinnitus aurium and slight deafness. This state of the mouth was attributable to a bad-fitting gold plate, which pressed the teeth of the upper jaw where the gum was attached, and its constant movements kept the gum in a hyperæmic condition. In this instance the patient was unconscious of any disease in his mouth. He was in the prime of life, and his health in general was unexceptionable, yet he himself was experiencing the *modus operandi* of the

denudation of the teeth from disease resulting from the pressure and movements of an ill-fitting plate in his own mouth.

Experiences like the above are by no means infrequent, and it is to be feared that the teeth are, in too many instances, treated by those whose mechanical skill is greater than their pathological acquirements. . . .

Vulcanite plates, however, produce diseases that are more frequently the source of reflex aural disease than any of the others worn. They have been in use for over twenty years, and their adoption is very general. The constituents of this material are caoutchouc, the sulphur required in the vulcanizing process, and vermilion, or the sulphide of mercury, used for the color it imparts. The quantity of the latter ingredient is believed to be equal in weight to both the other substances mentioned; accurate knowledge, however, is withheld by the manufacturers. These combined substances form a plastic mass which is found in commerce as thin sheets suitable for moulding into plates for the vulcanizing process. . . .

To bake this soft material into plates of sufficient hardness to support artificial teeth a temperature of about 160° C. is required. This degree of heat is not sufficient to completely volatilize the contained vermilion and sulphur. Vulcanite plates are porous, and when the process of baking is imperfect, as is frequently the case, their color is brighter, they are less dense, and, therefore, when used, more readily part with the vermilion and sulphur which they contain. In the process of finishing these plates, the fine filings become packed into these pores, ready to be gradually given up as the plate is worn. The acids, which sometimes are found in the mouth, do not materially affect vulcanite plates, but when subjected to the action of the saliva, which is ordinarily alkaline, it is believed that they are liable to become softened, and, therefore, more easily broken down. The gradual disintegration of these plates, as they are worn in the mouth, liberates a salt of mercury whose poisonous effects are well known.

Until physiological science has more accurately determined the effects of small quantities of mercury and sulphur when taken into the system by absorption, and until we are able to estimate how much of these drugs is given off when the plates are constantly retained in the mouth, no reliable estimate can be formed of the effects of wearing them. . . .

Vulcanite plates, besides yielding a poison, are otherwise injurious to health. Inquiries from dentists elicit the fact that at least one-third of all those who attempt to wear them experience great irritation of the mouth, an irritation that is frequently accompanied by hypersecretion of the buccal fluid. The sufferer usually lays aside the plate until informed of the necessity of becoming accustomed to its presence by uninterrupted use. Vulcanite is a non-conductor of heat, and the effect of its contact with the highly sensitive tissues of the mouth is to produce hyperæmia and inflammation. Another source of injury is the very close contact of these plates, which is maintained by atmospheric pressure and may favor the absorption of their substance. In such cases the hard palate, on account of the larger surface it exposes to the plate's action, suffers the most, but the gums and the lingual and buccal surfaces seldom escape.

The hyperæmia which a continuance of the thermic and irritant

action produces on the hard palate is frequently very marked; the parts are often found bathed with pus, especially the granular development that under these circumstances is found in the "air-chamber" of the plate. In some instances these granulations are polypous in their nature. The lower plates are in some respects less irritating, because they are not so large or so closely fitted, but, on the other hand, from being more completely exposed to the saliva in the bed of the mouth, they are liable to earlier softening and disintegration. When these plates are worn uninterruptedly day and night, of course their injurious effects are much greater.

The practical results of wearing vulcanite in the mouth are frequently seen; I have the notes of one where a gentleman, aged sixty-five years, wore a full upper set day and night for a period of ten years. He suffered during this time from constant irritation, and the heat of his mouth required that the plate should be frequently removed and the mouth cooled with water. Constantly-increasing irritation finally seemed to be the cause of a carcinomatous growth, and after an operation for its removal he died.

A medical friend of the writer has communicated a case that further elucidates the effects of these plates. He was consulted by a lady aged thirty-one years, whose principal complaint was of burning sensations in her mouth and throat. She had for six years worn a small vulcanite upper plate sustaining two teeth, but for about three months previous to her visit she had worn a larger plate, which seemed to greatly increase her difficulty. Her lower molars and bicuspsids, which were previously sound, were becoming loose from denudation of the roots and caries of the necks. The secretion of saliva was so excessive that the pillow upon which she lay at night was by morning saturated. She had been advised by her dentist to wear the plate day and night, and thus get used to it. Examination of the mouth of this patient showed the gums, tongue, hard palate, and whole buccal mucous membrane, as well as the throat, to be swollen and hyperæmic. The eyes suffered sympathetically, and she was generally nervous and depressed. This condition was unimproved by any treatment until a small gold plate was substituted for the vulcanite: she then made a complete recovery.

Another case coming under my own observation has a particular interest in this connection. The case was that of a gentleman of fifty-five years of age, whom I was called to see in consultation with Dr. C. J. Dumond. He had long worn a full set of artificial teeth mounted on vulcanite plates. His health had been for many years much shattered from some cause. For about a week before I saw this patient he had worn a new set of upper and lower vulcanite plates. They were of a bright brick-dust color, and, therefore, it is probable that they were imperfectly baked. The lower plate rested in part on a portion of gum made sensitive by the recent removal of two teeth from the left side of the jaw. After wearing these new plates for about a week, he was suddenly taken ill. The symptoms were nausea, which was soon followed by vomiting and purging, and the stomach was painful to the touch. These symptoms increased in severity from day to day, until he called in his family physician; he had not done so earlier on account of his absence from town.

The doctor, on making an examination of the case, suspected that

some toxic agent was at work, and when inspecting his mouth discovered the vulcanite plates to which allusion has been made. When I saw the patient, with Dr. Dumond, the more acute symptoms had passed away, and he only complained of prostration. The mouth, which had been sensitive and feverish, was better; the tongue, however, was still somewhat swollen and *heavily furred on the left side*. The patient made a rather slow recovery from this attack, and for some weeks he suffered from a cutaneous eruption over most of his body. He has not since worn the vulcanite plates. . . .

Regarding plates in general, it may be said that, if badly fitted, they are liable to do harm if any teeth remain in the mouth, by pressing the gums against the natural teeth; this pressure creates hyperæmia of the gum, and it is, therefore, probable that a constantly shifting plate always does some injury.

That all of the morbid conditions of the mouth which have been herein described may exist without serious or recognizable aural affections being developed cannot be denied, but progressive disease of the ears, often without the occurrence of pain, is, in my experience, more common when these oral affections are present than when the mouth and throat are in a healthy state. . . .

In conclusion, the writer would earnestly draw attention to the importance of a more general knowledge of orology being acquired by the profession. Frequent attacks of toothache should not be unheeded in any case, as the nervous irritation from this source not only sets up local inflammation that often leads to periostitis or abscess, but even more important lesions in distant parts may follow. . . .

It is believed that after a candid review of this subject it will be undenied that affections of the ear are not infrequently induced by pre-existing pathological changes in or about the mouth. It naturally follows that judicious treatment necessitates a careful appreciation of these etiological factors. It is not, however, in the province of this essay to discuss the treatment of oral diseases, and as to the management of the ear itself, when affected by reflex influences, the subject is too important for the limits to which the unexpected length of this paper warns the author that it must be confined. He will, therefore, defer the subject of treatment until another occasion.

In the foregoing paper it has been the writer's aim to touch on the more common of the oral affections that exert an influence on diseases of the ear, knowing that any account of the pathology of the buccal cavity and its contents approaching completeness would carry him beyond the scope of this essay.—*Samuel Sexton, M.D., Surgeon to the New York Ear Dispensary, etc., in American Journal of the Medical Sciences.*

CARCINOMA SIMULATING RANULA.—In October last, 1878, I was called to see Mrs. J——, a lady of fifty-five years, large and in apparent good health. She told me that about six months previously she had noticed an enlargement beneath the tip of the tongue, a little to the left side; that this had grown quite rapidly, without causing any pain or inconvenience beyond the displacement of the tongue, interfering somewhat with speech and deglutition. She had consulted several medical gentlemen, but had not succeeded in getting a decided opinion of the nature of the disease, although the majority seemed to think it a form of ranula.

At first sight it had all the ordinary appearances of a large ranula; it was about the size of a pullet's egg, beneath the left side of the tongue, projecting into the mouth, and also beneath the jaw in front of the angle. It was freely movable, and could be easily pushed into the mouth. Upon closer examination I was convinced that it did not contain the ordinary fluid of a ranula, as its walls seemed thicker, and there was very indistinct fluctuation.

I explained to her what I supposed to be the character of the tumor and advised an operation, for my diagnosis was an encysted tumor, such as Erichsen describes as one form of ranula.

November 21, I requested Dr. Triplett to assist me. The doctor, upon seeing the case, agreed in the diagnosis. We prevailed upon her to submit to the operation without ether. The doctor pushed the tumor well into the mouth and I transfixed its prominent convexity with a large tenaculum, which, however, was not easily done, this being the first intimation of its solid character. I then, with curved scissors, cut off the part included in the instrument, and, instead of cyst contents of any kind, a solid tumor was revealed. A suspicion of its true nature flashing upon me, I pushed my finger through the center of the growth, which gave way with some difficulty, and tore out the growth from the surrounding tissues. This was but imperfectly done, however, for the hemorrhage was profuse, and, with the impatience of the patient, caused me to desist. To stop the hemorrhage I was compelled to pack the wound with cotton wool, soaked in persulphate of iron; the blood was entirely venous.

In the evening the patient was quite comfortable. Dr. Triplett saw her with me the next morning; she complained of considerable soreness and stiffness of the jaws and neck, and called our attention especially to the left side, where we noticed a slight bulging of the sterno-mastoid about its middle, which we attributed to inflammatory swelling, but, upon closer examination, found to be due to an enlarged lymphatic gland upon the inner surface of that muscle. She said she had noticed this some time before, but as it had given her no trouble, thought it of no consequence; my attention had not been called to it, and it had entirely escaped my observation.

The plugs were taken out on the third and fourth days without bleeding. On the 26th we saw the patient in the morning, when she expressed herself as being much better, and she had been up nearly all day. In the evening I was sent for, and found patient suffering with pains and sense of distention below the chin. There was very marked increase of size since morning, the enlargement extending quite across to the opposite side. As this change had been so sudden I feared an attack of erysipelas, for there were several cases under my care at the hospital. I ordered a hop-poultice to be applied constantly. November 27, Dr. Triplett saw her with me. The swelling had extended and was very hard; I introduced a tenotome through the swelling in the middle line, but nothing but venous blood escaped; the poultice was continued, and in the evening she was somewhat better. November 28, the swelling had rapidly declined and her general condition excellent.

From this time her improvement was rapid. On the 30th a mass as large as the end of the thumb was discharged from the wound,

which gave much relief; it was of the same appearance as the original tumor except a little softer. December 5, Dr. Triplett saw the patient with me, and we examined the diseased part thoroughly. She was up and looked as well as ever, expressing her delight at the cure which she imagined had been effected. There was no external evidence of the tumor, and internally there was only a thickening of the mucous membrane under the left side of the tongue; the induration of the tissues had almost entirely disappeared.

The tumor, in appearance, was like a sarcoma or carcinoma, and I immediately took it to Dr. Schaeffer for examination with the microscope, and he pronounced it malignant.

In the latter part of January, 1879, it was noticed by the family physician that the tumor was rapidly returning, and I was asked to meet Drs. Hammett and Eliot in consultation. In a week the tumor had nearly reached its former dimensions, and she was very anxious for another operation. The result of the consultation was that any further interference would be unjustifiable; the nature of the case was explained to the family, which had been done by myself, however, as soon as I had been satisfied by the microscopical examination. I did not see her again, but was told from time to time by Dr. Eliot that the disease soon filled the space beneath the tongue, and a large fungous mass formed in the mouth, which caused great inconvenience in swallowing, etc. This was several times cut away or cauterized, but, of course, without any permanent benefit. She died Sunday, March 9, with symptoms of blood-poisoning.

This case has been one of great interest to me for several reasons, but chiefly on account of the false diagnosis which was made. I never before saw a malignant growth in that exact region, or one presenting so much the appearance of a simple encysted tumor. I have consulted all the modern text-books at hand, and find scarcely a reference to any such condition. Bryant speaks of having twice operated upon encysted tumors, with nearly solid contents, which he had mistaken for ranula; and Gross refers to similar cases, but none mention carcinomatous growths which might be mistaken for cysts. I record the case, therefore, not only because it is somewhat unique, but also with the expectation that it will afford some assistance in differential diagnosis.—*J. Ford Thompson, M. D., in National Medical Review.*

MYELOID SARCOMA OF JAW.—Sarah R., æt. 30, married; admitted to the Pennsylvania Hospital, under the care of Dr. R. J. Levis, on March 14, 1879. Her family and personal history offered no peculiarities. Two years previous to her admission, and shortly after the extraction of two molar teeth from the left side of the lower jaw, she noticed a slight swelling and ulceration of the gum around the sockets of the removed teeth. A month later a small piece of bone (alveolar process) came away, and after a month's time the place healed. Some time after this she noticed a small swelling, which was not sensitive or painful to touch, but very vascular, bleeding on the slightest pressure. Frequently, on waking in the morning, she found her mouth "full of blood." About a year ago a part of the tumor was removed; about six months ago an unpleasant odor was first noticed from the disease.

Upon admission, a tumor was found growing on the left side of the

inferior maxilla, at the part corresponding to the site of the extracted teeth. It was covered by vascular granulations, which bled very easily on handling. The odor from the mouth was very offensive.

On March 26, Dr. Levis excised this part of the bone; the incision, anteriorly, passed just in front of the first bicuspid tooth; posteriorly, at the angle of the jaw.

The specimen showed the lower half of the body of the jaw, at the seat of growth, entirely unchanged and not affected with disease; the periosteum covering it was normal. The tumor arose as a fungous mass from the alveolar border, and about half an inch above the level of this border of the bone. The breadth of the tumor, transversely to the jaw, measured two inches; its extension along the bone was about the same. The growth seemed to have sprung from the sockets of the teeth, and was extending around the remaining bicuspid tooth. The alveolar process had disappeared; the periosteum around the base of the tumor was much thickened, but there were no spiculæ or plates of bone to be found in it or on the surface of the tumor. The upper surface of the growth was broad, flattened, and ulcerated, and denuded of the mucous membrane; while laterally this structure covered the growth. The consistence of the tumor was very firm; on section, its appearance was nearly uniform throughout, of a reddish, flesh-like color. A microscopic examination of the tumor showed the structure to be that of myeloid or giant-cell sarcoma. The only peculiarity to be noticed was that the myeloid masses or giant cells were of small size.—*Dr. M. Longstreth, Pathological Society of Philadelphia—Philadelphia Medical Times.*

SARCOMA OF JAW—DEATH.—Dr. Erskine Mason presented a specimen showing sarcoma of the superior maxilla. A woman, aged twenty-four years, had an abscess of the face, of short duration, which healed two years before she came under observation. After the abscess closed she noticed a node near the cicatrix, which increased in size till she was seen by Dr. Mason. The maxilla was found to be involved in a tumor, which was suspected to be a sarcoma. The eyeball on the affected side was slightly protruded. The most urgent symptom was distressing pain, and to relieve that the whole of the maxilla was extirpated. The wound readily healed. There was relief of pain and improvement of vision of the affected eye. This continued for several months, the patient being apparently well. The tumor returned, however, and when examined it was found to have projected into the mouth. The most important symptom on the return was epistaxis. Extirpation was again practiced, with benefit, the wound healing very kindly. Exhausting hemorrhages occurred with the second return of the tumor, which resulted in death. The autopsy showed that the growth was of the spindle-celled form of sarcoma. It penetrated into the nasal fossa, the pharynx, the orbit, and through the sphenoid bone into the middle of the skull. At no time were there any cerebral symptoms which might not readily be attributed to the exhaustion.—*Medical and Surgical Reporter.*

TOOTH EXFOLIATED IN CONGENITAL SYPHILIS.—The president showed the crown of a central incisor tooth which had come from the upper jaw of an infant two months old. The child had a small abscess over each central incisor in the upper jaw; and on

opening one of the abscesses, the tooth exfoliated. He had long believed that the reason for the deformity of the permanent central incisor so characteristic of congenital syphilis was due to periostitis in early infancy, which tends to attack these teeth especially. He thought the teeth in Dr. Moore's case were very suggestive of congenital syphilis, but that they were not absolutely characteristic. He believed the living specimen shown by Mr. Parker to be one of syphilis. He could narrate several cases of enormous nodes, occurring at a late period of congenital syphilis, and he thought this fact was in favor of his theory, that severe and long continued late symptoms in syphilis occurred in connection with parts that had been affected in a transient manner at an early stage. In one such case spontaneous fracture of the femur had occurred. Dr. Wiltshire said that it appeared that asymmetry of skulls was regarded by some as due to syphilis. He had, however, carefully examined the skulls of young children for several years, and found that asymmetry was very common, and just that form of asymmetry described as occurring in the skulls exhibited by Dr. Barlow, the two halves of the skull being nearly or quite equal in size, but one half being a little farther forward than the other,—the right being more often in advance of the left. There was frequently a similar asymmetry of the palate and also of the face. He thought that these syphilitic skulls showed about the average amount of asymmetry seen in healthy children. Dr. Lees thought the asymmetry was very commonly associated with thickening of the skull, which would point to its being syphilitic. As regarded cranio-tabes he thought that eighty per cent. of the cases were certainly syphilitic, and that the remaining twenty per cent. were probably so. Out of thirty cases which he had seen there was only one which presented no signs of syphilis. He had seen a boy nine years of age, who presented nodes on the tibia, clavicles, and frontal bones. Syphilis was present in this case, but it was doubtful whether it was congenital or acquired. Dr. Norman Moore asked whether the asymmetry of syphilitic skulls was not one of special points of the skull rather than of general form. He thought that it was very rare to find a symmetrical skull in man, and still more so in some of the lower animals. Mr. Eve had recently dissected a fetus in which all the long bones presented the typical gelatiniform degeneration. Dr. Ormerod asked whether it were possible for a syphilitic skull to be thickened on the parietal and not on the frontal bones, and whether a small fontanelle without retiform eminences should be looked upon as syphilitic. Dr. Barlow, in reply, stated that he did not wish to imply that one might not find several forms of bone-disease in the same individual. He agreed that, where the bony changes were well marked, the other signs of congenital syphilis were generally slight or absent, the disease appearing to attack one tissue throughout the body. He had seen a case of large nodes like those of the girl shown by Mr. Parker, but in this case there was choroiditis disseminata. As regarded asymmetry, he did not think that M. Parrot would look upon asymmetrical skulls as necessarily syphilitic; but some syphilitic skulls were so soft that a high degree of asymmetry was easily produced in them. No doubt there might be an asymmetry due to osteophytes.—*Reports Pathological Society of London, in British Medical Journal.*

TREATMENT OF FISTULÆ AND SCARS OF THE CHEEK.—It is, in the first place, all-important to find out exactly the course taken by the fistula or fistulæ,—a matter of considerable difficulty sometimes; and the following classification may have its value in diagnosis: 1. Those opening into the cheek, with a track above the level of the buccal or labial mucous membrane, and which usually discharge saliva only. 2. Those whose track lies below this level, and which discharge pus and muco-purulent fluid and no saliva. 3. A complication of both forms, and which discharge both pus and saliva. With regard to the accurate detection of their course, an ordinary probe frequently gives merely a general idea of the direction, without passing into the offsets. I have always found that a fine filiform bougie, or better still, a fine india-rubber French bougie, is more useful than anything else. After having determined the course, irritating cause, and condition of the fistula, in order to avoid further scar, the dead bone, if there be any, is to be removed by delicate but strong forceps or gouge, and afterward the track should be washed out with a very strong solution of sulphuric acid, which has the effect of completely destroying the fistulous track; or by the introduction of minute crystals of nitrate of silver, until the granulations appear at the orifice, gentle pressure being maintained. A cicatrix, however carefully the treatment be carried out, is sure to remain, unsightly always and often troublesome, appearing as a “pucker” or adhesion to the underlying bone; and with regard to its treatment, I venture to state, from my own experience, that two methods are open to the surgeon, dependent on the extent or strength of these adhesions. The first consists in introducing a fine, blunt-pointed tenotome through the tissue of the cicatrix—laminating it, as it were—taking great care to leave it in free communication with the integument adjacent to it; next, to introduce between the split surfaces a thin strip of sheet-lead, which should be kept in, to prevent the adhesion of the surfaces divided by the tenotome. After a few days, the superficial lamina of the cicatrix may be subjected to gentle movement over the lower lamina, which the patient may conduct himself; this prevents adhesion, and renders the tissue pliant and assimilative. This may be termed the “passive movement” of the cicatrix. The second plan, if the former fails,—or indeed it may be advisable at first,—consists in dissecting away the adherent tissue entirely, vivifying the edges of the cicatrix and bringing them together by means of fine entomological pins, and so gaining a mere linear scar at worst, care being taken, by movement, to prevent permanent adhesion. The great elasticity of the cheek structure permits of this without any deformity resulting as regards expression. Manipulative skill is necessary for success, but results appear so satisfactory that I am inclined to think that, in cases where it is important, for the sake of the patient's looks, operative proceedings should be undertaken, the above suggestions may be of use.—*Edward Bellamy, F.R.C.S., in the Lancet.*

ABSCESS OF THE MOUTH.—This patient, a strong, healthy-looking man, aged forty-eight, was admitted May 31, 1878. He never had anything like his present illness before. From his wife it was ascertained that he had been a hard drinker for a long time. For about

two weeks before admission he suffered from toothache, affecting the two lower incisors of the right side. On the morning of the 27th of May on arising he noticed a hard lump of the size of a hickory-nut under his tongue, which could be felt externally. It was not painful or tender, but continued to increase in size, and for the first time became painful on the 29th. He gives no history of constitutional symptoms, has had no chill at any time, but some diarrhoea.

On admission his temperature is 105° , his pulse is strong and rapid. Upon looking into the mouth, which is opened with difficulty, a swelling is noticed under the tongue, which projects forward and upward and at first sight makes him look as if he had a double tongue. This swelling under the tongue is semi-translucent, and when punctured is diminished in size by the escape of a clear fluid in small quantity. Further examination of the mouth shows only tenderness of the inner surface of the cheeks. The two teeth spoken of were extracted and caused him no further trouble.

There seems to be an enlargement of the tissues comprising the floor of the mouth, more especially on the right side. The surface is smooth and of normal color. There is much tenderness on pressure, and it causes him considerable pain. There is more saliva than normal secreted. The urine has a specific gravity of 1012, is alkaline, and contains no albumen.

June 5.—Since admission his temperature has been considerably elevated; his general strength remains good.

On the night of June 3 the patient began to act strangely. Kept getting out of bed and talking in a rambling manner, though when spoken to he answered rationally. He is still somewhat incoherent in his speech, and requires to be tied in bed to prevent him from getting up. Says he "feels first-rate, but has rocks in his mouth." The pupils are normal. Yesterday he had severe headache, of which he does not complain to-day. The bowels are now regular. He passes his urine occasionally in bed, though conscious that he is doing so. The temperature has varied from $102\frac{1}{4}^{\circ}$ to $104\frac{3}{4}^{\circ}$.

He has no cough, but spits out a large amount of white, tenacious matter. His breath is very offensive.

Since admission the swelling has gradually increased in size, and reached its maximum about three days ago; since then it has not diminished. The entire lower jaw is now very much enlarged, principally at the lower part; the swelling involves the cheeks but little; the neck is considerably affected, especially at the sterno-mastoid muscles. The patient says he has no pain in it, nor does it seem to be tender. The color is red; to the touch it has been quite hard until yesterday, when it seemed as if pus was present, but the hypodermic needle failed to detect any.

The swelling in the mouth is less this morning; an incision was made underneath the jaw, a little to the right of the median line, which gave vent to blood and considerable gas, which had a very offensive odor. A silver probe introduced into the wound was deeply blackened, and was with difficulty cleaned again.

He has been receiving quin. sulph., gr. x t.i.d.; ice was applied to the swelling until yesterday, when poultices were used. For the headache ice was applied to the head. Last night, to quiet him, he was given chloral hydrat., gr. xv, and potass. bromid., ʒss .

In the course of the day the patient has been growing more and more delirious, and at evening requires to be tied firmly in bed. From the opening there is little or no discharge, and the tumor has not at all diminished in size. He has the appearance of a man with delirium tremens, and has illusions. The eyes roll wildly in the head; the face is pale; the pulse is felt with difficulty, owing to his violent movements; he passes his urine in bed; the respiratory murmur is heard distinctly; apparently there is no laryngeal obstruction; the character of the voice has not changed, and he breathes easily. He was ordered chloral hydrat., gr. xv, potass. bromid., gr. xxx, at one dose. About twenty minutes afterward he became quieter, breathing at longer intervals, though without difficulty, and thus quietly died.

Autopsy, twenty-one hours after death.—In the brain the pia mater was opaque and thickened; there was very considerable œdema and some congestion of the brain; the lateral ventricles contained an excess of clear fluid; the heart, liver, and spleen were about normal, though the latter was somewhat congested, as were also the kidneys; there was marked œdema of the right lung, and the remains of old pleurisy in the shape of adhesions.

Upon cutting into the swelling about the jaw a large mass of tissue was revealed that had lost its vitality. The color was dark, with occasional yellow streaks and foci of disorganization; there was no regular collection of pus into abscesses; the odor was intensely disagreeable; the destructive process extended down to the larynx, but did not involve the perichondrium or cartilages; the connective tissue beneath the sterno-hyoid and sterno-thyroid muscles was involved, and these muscles themselves were somewhat softened and discolored, as was all the tissue in the floor of the mouth. The jaw itself was not affected, except on the right side, where the last two molars had been; here there was slight necrosis, and from this the disorganizing process extended downward on the inner side of the jaw; the mucous membrane of the entire larynx was whiter than normal, and considerably swollen and moderately softened; the swelling of the aryteno-epiglottidean folds was particularly marked.—*Bellevue Hospital Reports, in Hospital Gazette.*

THE FUNGI OF THE MOUTH.—One of the marked symptoms of certain diseases is a thick coating or "fur" on the tongue. In a recent paper before the British Royal Society, Mr. H. T. Butlin, F.R.C.S., described this fur as consisting chiefly of (1) *débris* of food and bubbles of mucus and saliva; (2) epithelium; (3) masses which appear at first to consist of granular matter, but which are the glœa of certain forms of schistomycetes. That the last named of these three is the essential constituent is proved by the fact that the quantity of the glœa corresponds roughly with the quantity of fur present, and that its position upon the tongue corresponds exactly with that of the fur, both covering the tops of the filiform papillæ, but not usually lying between them. In order to ascertain the true nature of the glœa, and to obtain it in a purer form, it was cultivated upon a warm stage. Several fungi were discovered, but only two of these were present in every instance, *Micrococcus* and *Bacillus subtilis*; and, as the glœa produced artificially was similar to that existing

naturally in the tongue fur, it is believed that fur is composed essentially of these two fungi. *Micrococcus* developed freely and abundantly, forming large masses of yellow or brownish-yellow color. *Bacillus* did not develop, but existed in greater or less abundance in all the cases examined. Its development was probably prevented by the presence of other developing organisms, from which it was found impossible to separate it. It appeared to be identical with the *Lepthothrix buccalis* of Robin. Although it did not develop under artificial conditions, it is probable that development takes place freely upon the surface of the tongue. Its habitual occurrence there and the presence of spore-bearing filaments favor this view. Besides these fungi there were present, more or less constantly, *Bacterium termo*, *Sarcini ventriculi*, *Spirochaeta plicatilis*, and a larger form of *Spirillum* (or rather *Vibrio*). *Sarcini ventriculi* was frequently present, and generally developed quickly, forming large masses of a yellow or yellowish-brown color. *Spirochaeta plicatilis* occurred only in two or three of the specimens examined. *Bacterium termo* existed in some of the furs, and twice developed with such rapidity that the whole of the fluid was crowded with these organisms. The slime between and around the teeth was found to consist of the same fungi as the tongue fur, but the rods of *Bacillus* were longer, probably owing to the disturbing causes being fewer.—*Scientific American*.

BUCCAL RASHES.—The remarks made at the Pathological Society on a case of "Peculiar Circular Wandering Rash on the Tongue," as reported in the *Journal*, deserve to be supplemented, inasmuch as no one of the speakers claims more than a casual acquaintance with the subject. Perhaps, in the individual case, its erratic course and rapidity of disappearance were more important diagnostic points than the uncertain result of the search for a fungus. I should not, however, think the case of much importance (it does not seem to me so rare or peculiar) but for the fact that few seem to have been familiar with such appearances. I do not regard them as rare on any portion of the mucous membrane of the mouth. Further, not only such cases, but a number of others, will only be understood by comparing them with similar pathological processes on the skin. In fact, as I have elsewhere pointed out, the connection between the diseases of the skin and mucous membranes is fully illustrated in the mouth and throat; and, although the tongue is perhaps less apt to take on certain forms of disease than the rest of the buccal surface, it is prone to be affected by other circumstances. Slight forms of catarrhal inflammation are common enough, but do not often necessitate medical advice, and hence they are scarcely studied. But ulceration of the tongue, lips, cheeks, pharynx, and nasal passages is more troublesome, and proceeds from various causes. The irritation of teething is credited by almost all practitioners with numerous infantile mouth-troubles. But the forms of stomatitis arising from this, and the direct influence of mechanical or chemical injury, are less likely to be misunderstood than those associated with similar processes on the skin. Thus, in the exanthemata, we may watch exactly similar processes going on simultaneously on the skin and mucous membrane; or, as in other cutaneous affections, we may see them spread from the outer surface to the mouth. The pustules of

smallpox are sufficiently significant. The rash of measles spreads from one structure to the other. On the mucous membrane the course of these eruptions is more rapid than on the skin. Erysipelas is another example. Herpes and pemphigus strikingly illustrate the same facts. In scarlatina the condition of the tongue at an early stage is proverbial, and much relied on in diagnosis; but the disease of the throat is too deep to compare with more superficial affections. Besides these examples, scurvy, purpura, and other diseases may, as I have long taught,* be advantageously studied on both the cutaneous and mucous membrane.—*Prosser James, M.D., in British Medical Journal.*

RETARDED DENTITION.—Mr. T. Edgelow reports in the *Medical Times and Gazette* a case of retarded dentition that had lately come under his notice. The patient, a girl aged fourteen, epileptic since her birth, had great deficiency of the permanent teeth, the upper and lower incisors being the only teeth that met. She was small, short, had curvature of the spine and a large head, but there was no syphilitic history. No teeth had ever been removed, and there was no reliable history of the primary teeth. She suffered from great want of masticating power, and Mr. Edgelow thought that by adapting plates it might be the means of causing the eruption of the other teeth.—*Louisville Medical News.*

SALIVARY CALCULUS SIMULATING MALIGNANT DISEASE.—*Sir,*—The case reported by Mr. Gibbs in the *Journal* of this date recalls a remarkable case that occurred in my own practice in Java in 1862. The wife of the captain of one of the Dutch steam-packets plying between Batavia and Singapore had long suffered from great pain and swelling in the left submaxillary region, and lately the discharge from the mouth had become so offensive that she could no longer occupy her cabin, but was obliged to be secluded on shore. Having been seen by many medical men, and becoming gradually worse and worse, and more and more repulsive to her attendants, I was asked to see her, as a lady dying of cancer of the jaw. Careful examination convinced me the disease was not malignant; and, on pressing rather firmly over the gland, a calculus as large as a cherry-stone escaped from an opening that had formed externally, falling at some distance upon the floor of the room. In a few days the patient was able to resume her position in society.—I am, etc.—*Richard Neale, M.D., London, in British Medical Journal.*

INTERMITTENT HEMORRHAGES CAUSED BY MALARIA.—At the French Association for the Advancement of Science, M. Massart spoke on this topic. He quoted a curious case that had recently come under his observation. A lady who had had a tooth extracted by him told him, two days after the operation, that she had lost a great quantity of blood by hemorrhage soon after. Two days later she had another hemorrhage, and in spite of all his efforts to arrest it, another very considerable hemorrhage took place after an interval of two days more. Struck by the periodical recurrence of these hemorrhages,

* Sore Throat: its Nature, Varieties, and Treatment; including the connection between Affections of the Throat and other Diseases.

M. Massart prescribed sulphate of quinine, and the phenomenon ceased.

During the discussion which followed, M. Castan observed that similar cases occurred very frequently in Montpellier.—*Medical and Surgical Reporter*.

SUDDEN DEATH DURING THE EXTRACTION OF A TOOTH.—Dr. A. Poulet, in his treatise on "Foreign Bodies in Surgery," mentions several cases where a tooth slipped into the larynx while it was being extracted, and gave rise to very dangerous symptoms. Two of these cases proved fatal. It is noteworthy that in these latter cases the patients had been rendered insensible by nitrous oxide. A few weeks ago, a similar deplorable accident took place at a dentist's in Paris. The patient was a child, aged seven, who was having a molar tooth extracted. The child struggled violently, and the tooth slipped from the forceps into the larynx. The patient died on the spot, of suffocation. This case is not unlike one described by M. Rigaud, who saw a child upon whom he was operating for harelip die under his hands. The necropsy revealed a milk-tooth sticking in the rima glottidis, and completely obstructing the opening.—*British Medical Journal*.

ROYAL COLLEGE OF SURGEONS OF ENGLAND: EXAMINATIONS IN DENTAL SURGERY.—These examinations have undergone great improvements, as, in addition to the usual written and oral examination, there is a practical examination of patients of both sexes selected from hospitals, etc. Each candidate is required to make a gold filling. He must have prepared the cavity on a previous occasion, so that nothing has to be done but to insert the gold. The fillings must be such as will take from half to three-quarters of an hour to accomplish. Each candidate is required to take all his own plugging instruments and materials, rubber dam, clamps, and gold.—*British Medical Journal*.

HINTS AND QUERIES.

"He that questioneth much shall learn much."—BACON.

CORRESPONDENTS desiring a reply in this department are requested to make use of *distinctive signatures or initials*, and avoid the practice of signing their communications Reader, Subscriber, etc.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names. We cannot insert queries or replies except they are so accompanied. Names not necessarily for publication.

I AM occasionally troubled with an ill-fitting rubber plate even after the utmost care has been taken in impression and manipulation. I don't like the Scott or the Relyea soft rubber disk for such cases. Can any one give a better method? Will *lining* the plate with soft rubber secure a fit,—and how long will the rubber remain "soft" in wear? Is there such a thing as Warner's patented flexible lining for such cases?—A. B. C.

IN half an hour after extracting from the lower jaw two wisdom-teeth and one molar, deafness ensued, which has continued for nearly four weeks. The operation was attended with no unusual features, and the patient suffers no other inconvenience. Will some reader explain this and advise as to treatment?—H. K.

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No. 3.

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to Act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
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(Continued from page 15.)

XIII. *Putrescent Pulps*.—When discussing this cause for periodontitis (DENTAL COSMOS, October, 1878), my remarks were confined exclusively to gradations of condition occurring as the frequent results of an unnecessary amount of excavating in cavities of deep-seated decay; of the introduction of metal fillings of high conductivity into too close proximity with pulps; or, of failures of attempts at pulp-conservation by means of “intermediates,” either as “caps” or “linings” or medicaments.

At that time I referred to the pain in the teeth; to the sympathetic and reflex character of the suffering; to its location in the jaw, cheek, eye, ear, and even in distant parts, such as the neck, arms, hands, etc.; to its variety in intensity, length of duration, severity of throbbing, shooting, lancinating, and darting.

Attention was directed to the fact that as portion after portion of the pulp became devitalized, the terminal parts at last became involved, passed through the various stages of altered circulation, and, by dying, gave rise to the necessity for such effort upon the part of outside structures as would eventuate in separation of the dead pulp from adjoining living tissue, and the establishment of that comparative normality which would permit the maintenance of the now semi-vital tooth *in situ*.

Mention was made of the *tenderness* of the tooth upon pressure, which was the usual concomitant of this process; of its probable duration, which is longer or shorter, according to weakness or strength

of recuperative energy; of its intensity, which is according to the individual susceptibility; and, finally, of its usual prompt passing away.

Also to the "treacherous quiet" which almost always supervened after these inflictions had been endured, and to the gradual opacity of crown which then replaced the former translucency of vitality, and to the further change of color, which, in its grayish and bluish hues, told, unmistakably, of the death and disintegration of at least the bulbous portion of the pulp and of its partial filtration into dental tissue.

The *length of time* during which this "quiet" lasted was placed, variably, at from a *few weeks* (three or four) to *several months* (six), and from that period to the *usual* one of from *eighteen months* to *three years*, according to temperamental attributes, systemic condition, maturity of tooth, and density of tooth-structure.

Finally, it was stated that in exceptional cases even longer periods of time would elapse, until we should have *five, seven, and even nine* years intervening between the cessation of paroxysmal pains in dying pulps and the subsequent occurrence of peridental irritation from the resultant pulp-putrescence.

In this connection I shall again urge that the indication for relief in such cases is the *making of an entrance into the pulp-cavity*, in order that the mephitic gas from pulp-decomposition may have other exit than through the apical foramen. To this end the *first* consideration is as to *how* this can be done with the least possible infliction to the patient; *second*, *where* shall it be done with the least present injury to tooth or to filling, and with the promise of the best result in after-treatment.

In discussing the first proposition, it is necessary to refer to the fact that the point of *most direct* entrance into the pulp-cavity pertaining to each tooth has been given when upon "extirpating the dental pulp," and this would naturally suggest itself as being the proper place for making the orifice for relief; but other considerations now, *for the time*, should take precedence, and, according to the severity of the pain existing; the capability of endurance on the part of the patient; the age of the patient; the length of duration of past suffering and analogous concomitants, so should the question of *immediate relief* with "*the least possible infliction to the patient*" be held as of more or less paramount importance.

In some cases the *easy removal* of a filling, and the possible necessity for puncturing the thin stratum of dentine which may yet exist between the cavity of decay and the pulp-cavity, will be the most acceptable means for relief.

In other cases, the mere making of an *orifice* through a filling by means of a spear-pointed drill will best afford the first alleviation.

And yet other cases may present where a "tap" will be recognized as the thing required for future work, together with the fact that present need will permit the drilling of a *small* drill-hole in the proper position for subsequent enlargement prior to "treating."

Finally, still other cases will offer in which drill-holes may be advantageously made without any reference to any other point except that of present relief. These are such as have *large*, solidly impacted, and perfectly good gold fillings directly in such position as would afford the best entrance into the pulp-cavities, and *through which fillings* (without removing them) the best future treatment can be made; or, such cases as have "deep" but *inaccessible* cavities of decay (on mesial or distal face of tooth with thick wall of articulating enamel and dentine) which it is proposed to open into and utilize for future entrance.

In such cases a small drill-hole should be made near the neck of the tooth; *distally* if it be an incisor, cuspid, or first bicuspid (particularly if superior teeth), *buccally* if it be a second bicuspid, and *mesially* if it be a molar of either jaw.

The object in selecting these positions is, that the orifice filling may be least conspicuous when made; and the orifice should be permanently filled when relief has been obtained and the entrance into the pulp-cavity made: after which the pulp should be extirpated, such treatment as is indicated given, and the tooth made ready for final filling.

I have already spoken decidedly against the almost universal practice of medicating teeth which have peridental irritation from putrescing pulps, immediately after having given relief by drilling into the pulp-cavities.

I desire to impress this teaching because of the general belief that *something more* than the mere making of an opening is demanded. It is also a popular belief that the tooth will surely ache if it is "left open." The fact that *it ached before it was opened* is lost sight of; the fact that it became easier, and at last comfortable, *after it was opened* is ignored, and thus it is that, too frequently, practitioner (actively) and patient (tacitly) do what they can to *undo* that which has so promptly afforded the desired relief.

It is additionally strange that the immediate re-stopping of the tooth should not alone have been deemed correct practice, but that the placing of creasote in the pulp-cavity, together with the dipping of the cotton, with which the opening was to be stopped, *in creasote*, should have come to be received as an *additional means* for insuring immunity from suffering.

It is probable that no other medicament, except, perhaps, the *tincture of iodine*, could have been selected from the dental pharmacopœia

the use of which would have more certainly been followed by increased irritation, by permeation, of already irritated tissues, or by mechanically obstructing the only avenue for the passage of existing effusions by inspissating the contents of pulp-cavities and canals.

I shall, therefore, strongly advise against any internal medication of these teeth, and, above all, against the introduction of cotton (pellets or twists), either dry or medicated, into the openings which have so quickly proved their utility.

It is sometimes *not sufficient* for relief that *small* openings be made into the pulp-cavities, even although a small probe may have been gently introduced and withdrawn, thus more effectually securing the escape of the mephitic gas. When this is the case the opening should be enlarged, care being exercised that this is done very gently and in a practically non-irritating manner. Should this prove insufficient, further directions will be given in place under the 3d division of local treatment.

It is at this point that it seems to me most proper to discuss the *rationale* of such portion of the treatment for periodontitis from putrescing pulps as has been given, and which is purely manipulative.

This drilling "vents" (as they are sometimes called) in teeth, is no new thing; on the contrary, it has been done for *more than thirty years*.

It was first used as a curative to subsequent irritation from filling over devitalized or partially devitalized pulps, and seems to have been one of the natural outgrowths of the practice of arsenical devitalization, as this was first accomplished without the recognized necessity of removing any of the pulp-tissue, and, indeed, without the necessity of even entering the pulp-cavity.

As time progressed and the teeth which had had their pulps destroyed by arsenious acid were beginning, in great number, to give trouble, from pulp-putrescence, this not being then understood, it was largely attributed to the *poisonous* medicament, but it gradually came to be noticed by the experimenters of that day that in a majority of instances the removal of the filling was soon productive of relief, and that all was quiet *until the tooth was refilled*, when trouble was again very liable to occur, which, notwithstanding the scarification, leeching, poulticing, and purging treatment then in vogue, very generally resulted either in extraction or the formation of an abscess.

The fact that the opening into the pulp-cavity and the affording of relief were *concomitant*, after a time *forced a recognition*, and within a very few years (less than ten) after the introduction of arsenic for pulp-devitalization the practice of relieving peridental irritation by drilling into the pulp-cavity from the neck of the tooth instead of by removal of filling was indulged in by quite a number of those

who were persistently using the arsenious paste suggested by Dr. Spooner, of Montreal.

It was as the result of this practice, that Dr. Josiah F. Flagg, of Boston, suggested the idea of thus drilling an orifice *at the time of filling* which should act as a *preventive* to future irritation.

Even with the knowledge of to-day we can recognize that this was a great step in advance, and, while it would be regarded as *not good practice* to do this now, it nevertheless must be admitted that we are sometimes forced to adopt this expedient as the only means by which, in certain cases, teeth can be retained.

It is at this time that mention should be made of an operation suggested by Dr. S. P. Hullihen, called "rhizodontropy," which has been, singularly enough, regarded by many as so "delicate and scientific" as to merit much praise, but which is, in truth, both impracticable and unscientific.

This operation consisted in puncturing the gum, above the edge of the alveolar process, with a fine, spear-pointed drill, then drilling through the outer plate of the process, reaching the root of the tooth, passing on through the root until the pulp-canal was reached, and then bleeding the pulp just sufficiently to relieve existing congestion, and thus *preserve the vitality of the pulp*.

To say that this operation *with this result* is impossible might be unsafe, but I regard it as perfectly safe to state it as my opinion that not one operator in one hundred could succeed in doing it *once* in one hundred times.

I have seen quite a number of these attempts, and never one which did not result in *death of the pulp*, and, *more than this*, in the destruction of the gum-tissue from the puncture to the free edge, in the frequent caries of the denuded portion of process, and in the consequent denudation of the drilled root.

It was from having early seen these results, that more than twenty years ago I taught my classes that which I now write concerning this operation.

It is for this reason that I have practiced and recommended the older operation of drilling at the neck of the tooth *just beneath the free edge of the gum*, and this for the *specific purpose* of affording vent for mephitic gas, or for the effusions of chronic congestion of alveolo-dental tissues.

It is the existence of the last-mentioned condition upon which is largely based the need for *leaving open* the drill-hole in cases of periodontitis from putrescing pulp-tissue; for, added to the mephitic exhalations of the still remaining pulp, we have to take cognizance of the inflamed condition of the peridental membranes,—that condition which is giving the pain to the patient; which is the cause for the

sense of great elongation of the tooth; which responds so acutely upon striking upon the tooth; which, in short, is the real "seat of war" and actual point of attack, and upon which we have only *commenced to make an impression by our first effort at removal of the cause.*

(To be continued.)

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR meeting of the society, held at the residence of Dr. A. L. Northrop, Tuesday evening, December 16, 1879.

President, Dr. A. L. Northrop, in the chair.

INCIDENTS OF PRACTICE.

Dr. C. E. Francis. I should like to get an expression of opinion from gentlemen present in regard to the use of a substance for polishing teeth, known as "tucum fiber." Dr. Miller some months ago presented me with a little to try. I used it and liked it. At a recent meeting of the District Society, however, I was surprised to hear one of our members, whose opinion I esteem very highly, speak adversely to its use. Since then I have tried it and re-tried it, but do not find the objections to its use then described. After polishing fillings and approximal surfaces of teeth for different patients, and even for children, I have asked them if its use was disagreeable, and they have invariably answered "no." I should like to know if other gentlemen have used it, and if so, to have them express their opinion in regard to this substance.

Dr. A. H. Brockway. I think I introduced the tucum fiber to the notice of the profession some two years ago. My attention was called to it by the late Dr. R. T. Ambler. Since then I have used it constantly and with great satisfaction. I should very much dislike to be deprived of it now. What others think of it I do not know, but in my hands it has been a very satisfactory and useful article, and I have never heard patients make any objections to its use. The advantage I find in it over the ordinary polishing materials is, that it is stronger in its substance; it is naturally charged with silex, and consequently can be used dry, if necessary, which is sometimes quite an important consideration. I use it almost invariably in finishing approximal fillings and for polishing the natural teeth,—often dry, but frequently with pumice-stone and water.

Dr. Latimer. We were told some time ago that the tucum fiber was a species of cactus, and that it was objectionable on that account. But I am informed by the gentleman who imports it that such is not the

case. The fiber is that of a large tree growing in Brazil. I have tried the article pretty thoroughly, and I like it very much for the uses for which it is recommended.

Dr. G. A. Mills. I used some of this fiber some time ago, but did not find any of the advantages claimed for it which I could not obtain in greater degree by the use of other materials, such as floss-silk.

Dr. S. G. Perry. I have used this article since Dr. Brockway brought it to our notice. It is particularly well suited to insinuating between the front teeth when close together. I never found the cleansing of teeth so satisfactory as since I have used the material, and I have never known of any objection to its use made by my patients.

Dr. Wm. Jarvie, Jr. I have used this fiber for the last two years, and it is exceedingly useful in polishing between the teeth and on the surface of approximal fillings. The only objection to its use I ever heard from a patient, was a remark by a lady that "at first I thought you were using the hair from a blonde wig." I have used less of it since, as we all know its great resemblance to the locks of a modern beauty.

Dr. B. Lord. It will be remembered that at the last two meetings of this society the subject of nerve-broaches has been discussed. At one of these meetings I spoke of the various kinds of broaches that I had made and used and found to be the best, and I have brought some of each kind with me this evening, that any one can see them who may wish to.

It will be recalled that I spoke of piano-wire as being the best steel for these instruments of any that I have ever used. The steel is very tough, and sufficiently stiff after it is filed down to the required size, without further stiffening by hammering or tempering in the ordinary way. The instruments I have brought with me will show how I have them made. The other broaches that I have with me show the different kinds of steel that I have used in the making of these instruments. The advantage of piano-wire is, that all that is required in the making of the broaches is the filing of it down to the required size.

Dr. Bronson. Is there no other temper required in the instrument than there is in the steel as you procure it?

Dr. Lord. No; that is the advantage of the piano-wire steel, as I have stated, and the uniformity of the temper enables us to know just what it will bear, and we can trust it every time. I use for barbing the broaches—which I prefer to do myself rather than have the instrument-maker do it—a narrow, highly-tempered, chilled instrument, beveled from both sides, such as the one I have with me.

Dr. W. H. Dwinelle. There is a variety of ways of tempering steel. It can be tempered by heating and plunging it in cold water.

It can be tempered by being hammered, rolled into plate, or by being drawn into wire; can be drawn until it is as brittle as glass by thus being tempered by compression. So that piano-wire is, so to speak, when it comes to us, in a state of peculiar *temperment*, to coin a word in this connection. It is thus far *tempered* to all intents and purposes. Pure gold may be tempered by being hammered, drawn into wire, rolled into plate, or being manipulated by instruments. By this last process, especially if crystal gold be used, and small-pointed instruments, it may almost rival tempered steel in hardness. But when gold is used in the arts, or for commercial purposes, it is alloyed with copper and silver, to prevent its sweating or wearing by attrition.

I remember a great many years ago Dr. Maynard gave me my first lesson in making an instrument of the character under discussion. Take the steel and remove all the temper out of it by heating it to a red heat, and then plunging it into hot ashes and allowing it to remain till it is cold; then shape the steel into instruments with angles ready for the barbing, or into round ones for filling nerve-canals. These last Dr. Maynard tempered simply by burnishing them.

Dr. S. G. Perry. Some instruments I have with me are copies of those I saw in his case seven or eight years ago, and my knowledge of how to make and temper them is due to Dr. Maynard, particularly the idea of burnishing them.

Dr. Dwinelle. I desire to do justice to Dr. Maynard in another respect. It was about thirty-five years ago that Dr. Maynard gave me this little lesson, in my office at Cazenovia. At that time he showed me the system of barbing. It has been modified and qualified, but the barb system was practiced by Dr. Maynard thirty-five years ago. I speak of this because it has been claimed by some who were in their baby-clothes at that time that they were the original inventors. It is astonishing how many old inventions are re-invented in these latter days. I say this in simple justice to Dr. Maynard, who did not claim, however, to be the first to use the nerve instrument. I presume Dr. Hudson antedates Dr. Maynard, but he probably never made instruments equal to those of Dr. Maynard.

Dr. N. W. Kingsley. Some ten days ago a lady came to me from Illinois, whose speech was so defective that I, who am accustomed to hear cleft-palate people talk, could understand but little she said, even after two or three repetitions. Upon examining her mouth, I found as perfect a roof, palate, and uvula, except that the uvula was a little shorter than usual, as I ever saw in any mouth. There is not one of us who might not have worked at her mouth a number of times and never have discovered there had ever been a cleft palate.

She was born with such a cleft, and it was sewed up by Dr. Warren, of Boston, some twenty-five years ago. It was altogether the most beautiful operation I ever saw,—so perfect that the marks of the sutures are nearly obliterated, and yet that woman's speech is in the condition I have described. I had no thought of bringing this subject before you again, but the other evening your president was in my office and I showed him the models of this case, and explained the principle of my proposed treatment. Some things which I stated appeared new to him, and in accordance with his wish I repeat a statement of the principles involved in remedying all such defects.

Since that evening I have been wondering if all my hearers from time to time for nearly twenty years, had failed to comprehend that which I had endeavored to impress upon them, and I have almost come to the conclusion that I am unable to present the truth understandingly, or else my hearers have not believed what I was saying.

Now what I am about to say, using the name of a gentleman present, need not be taken as a reflection upon him, because the information upon which I base my remarks may not have been correct. I use the incident to impress more forcibly my subject.

Some time within the last two years, as nearly as I can remember, I was listening to a report of a clinic at a meeting of the District Society, wherein it was stated that a boy with a cleft palate had been brought from New Jersey for advice. The chairman of the clinic committee reported that Dr. W. H. Atkinson said that the proper thing to do was to sew it up, and described to the gentlemen present the method, and, as I was afterwards told, Dr. Atkinson expected to operate for the boy at a subsequent clinic. I heard this report with astonishment, because I could not have believed that any one at this day would talk about sewing up a cleft palate. I have over and over again demonstrated scientifically and absolutely the impossibility of its doing the patient any good whatever; that it never did, under any circumstances, and never can. This ought not to be new to you or to any dentist, and yet there are dentists scattered throughout the United States who think it the proof of their highest skill to get hold of a cleft palate and sew it up. Now, gentlemen, the case of the lady just described is only one more illustration of the failure of staphyloraphy. This lady says, from the time the palate was sewed up the speech was worse, and she has never spoken as well since, has never been understood as well by her friends, acquaintances, or strangers, from that time to the present. Why cannot this lady articulate distinctly? Naturally one would say a perfect roof to the mouth will certainly be a great benefit in place of a split roof. What is the reason it is not? Simply because the newly-formed palate is so short that it cannot reach the posterior pharyngeal wall, and under no

circumstances can it be made to reach it; and no matter how much the pharyngeal wall bulges forward, there is still an opening behind the posterior border of the palate, through which the voice escapes, and every sound of the English language will be imperfectly intoned save three. This case was one of the most beautiful illustrations I ever saw of the failure of surgery to improve the speech. This case was also peculiarly successful in another respect. There was less rigidity than I had ever seen after an operation; there was nearly or quite as much movement as with a palate that had never been deformed. Dr. Little and myself experimented with this case by stimulating the action of the muscles of the palate and pharynx to their utmost, and by no possibility could the passage from the pharynx to the nares be closed. With the utmost contraction the opening was as large as a dime, and through this the voice constantly escapes.

The remedy for her speech lies in providing some means by which this opening can be closed. I cannot introduce an artificial palate in the usual way; the surgical operation has prevented that method. An alternative I proceeded to carry out, as follows: I made an incision through the soft palate into the nasal cavity, beginning at the posterior border of the hard palate, and cutting back about half an inch. She was wearing a partial upper set of teeth, to which I attached a little tent to enter this opening and keep it from contracting or closing. In a few days I shall have completed an artificial palate for her, which will be inserted by passing up through the opening into the posterior nares and then down behind the palate to the pharyngeal wall, elongating by art her present natural palate. This apron or palate extension can be seen when in place, appearing as a diaphragm across the pharynx, behind the uvula. It is not so large as to interfere with free respiration, but is large enough to fill the passage completely when the levatores of the palate and constrictors of the pharynx are in action. These same movements will enable her to articulate perfectly every sound which heretofore has been defective.

In closing this description let me reiterate the statement that a surgical operation for cleft palate should be condemned under any and all circumstances; that it has not and probably never can give the patient the power of perfect speech, no matter how high the authority that disputes this position.

Dr. C. F. W. Bödecker. A few months ago I saw a lady who had had the operation of staphyloraphy performed. The operation was a great success, so far as the closure of the cleft was concerned; but her speech was so bad that it was almost impossible for me to understand a word she said.

Dr. E. A. Bogue. I have seen a number of operations that have

been performed for cleft palate, and I never yet have seen speech benefited by the operation. Improvement of the voice is another thing. One of the finest operations in staphyloraphy I ever saw was for a girl of about twenty, who was cashier of a restaurant in Chicago. The speech was made decidedly worse. The second artificial palate I put in I was obliged to cut the palate open, after an operation in staphyloraphy had been performed, to insert the artificial appliance in place.

The following paper, "On the Treatment and Prevention of Dental Caries during Childhood," by Dr. Henry C. Quinby, Liverpool, England, was then read by the secretary:

Having been more than twenty years in practice, I have seen many families of young people grow up to maturity, and have had probably an exceptionally good opportunity to compare the teeth of members of the same families which have come under my care, where some of the children had reached the age of puberty, and others were much younger. Of course, one will sometimes find in the same family good teeth and bad teeth; but, in the majority of cases, I have found the type of teeth in families to be similar, whether they have been of a hardy or of a perishable nature. Thus it has often happened that I have had a family come into my hands where the eldest children would show unmistakable signs that energetic treatment would be necessary to preserve a reasonably good denture, while younger ones were suffering from the ills of first dentition, affording very fair means of comparing the results of care in time and want of care until actual suffering made it imperative, and it would be strange indeed if this experience had not taught me some lessons which may be of practical value to the profession. To the conscientious practitioner, earnestly wishful to do the best for the patient, the first question is not, Can I make a brilliant operation here? not, What will other dentists think of my treatment? but, What will be the *future* of this case? Our thoughts should go beyond the present time when we are treating children's teeth, and try to realize what will be the condition of the mouth a few years hence when it is more developed. We should study prognosis as well as diagnosis, and we must not forget that it is our duty to endeavor to win the confidence of the child, and to make it understand that our object is to save it from suffering; for, if we plant in the mind of a child the seeds of fear and distrust, we are sowing the tares which, in spite of all our skill, may grow more rapidly than the corn, teaching it to conceal defects that early attention might remove, until they threaten the very life of the crop we wish to rear.

We will take a suppositious case of a child six years of age, with

the first permanent molars just through the gum. It is a well-established fact that in seventy-five or eighty per cent. of the cases that come into a dentist's hands the first permanent molars are defective, and in the case under consideration we find fissures in the enamel that in a short time would develop into serious cavities of decay. It is, perhaps, the child's first visit to a dentist, and the little patient has a vague idea of horrors to be endured that requires but little of realization to grow into a lasting dread of the dentist's chair and its surroundings. Shall we, then, fill these fissures at once with gold, and make what is generally considered a permanent protection? I have seen cases where this had been attempted, and, I am sorry to say, I have attempted it myself, but I do not think it is right. A very slight excavation of such a fissure, or, if it has reached such a stage of development, cavity of decay, and the placing in it of a gutta-percha filling that can be made, excavation and all, in five or ten minutes, will protect the tooth perfectly for twelve months, and without much suffering to the child, or too severely taxing its patience. Could we be certain of this much from a gold filling,—the best we could make in the mouth of a nervous, frightened child? I do not think so. One child in ten might be induced to submit, but would it willingly come again to have another tooth protected from what, at the worst, is to the child only a pain that somebody says may come, while the remedy is pain that seems willfully inflicted? Knowing that the best gold filling we can make in such cases may fail, why, then, is it not best to recognize the possibility of failure in the beginning, and make what we can call a temporary filling, and let the child go away feeling that after all the dentist is not so terrible as he had been pictured? We cannot but feel sorry for a child that has nerved itself up to bear the suffering which the gentlest operator cannot help inflicting if he makes the so-called permanent operation, only to find, as he often will, that it must be repeated again, and perhaps again. The gutta-percha filling will, of course, have to be renewed, but one peculiar advantage of this material is the perfect protection it affords the tooth, even when it is much worn, and after a few months of such protection a cavity that has been very sensitive may be excavated and refilled with very little pain. This I impute to the non-conductibility of gutta-percha. We all know how a metallic filling in a sensitive tooth subjects it to a constant succession of shocks from everything that is taken into the mouth above or below the temperature of the blood; but changes of temperature are not felt through gutta-percha. Therefore the best way to treat sensitive dentine is to excavate slightly, if we cannot do better, and make even an imperfect gutta-percha stopping, allowing it to remain a few weeks, or as long as we can trust it, when we shall find that we

can excavate properly, where before the patient could scarcely bear a touch.

It may be said that such treatment keeps the patient always coming to us, and that the fear of large fees will deter many from submitting to it; but if our charges are proportionate to the time spent, few, if any, will object to a treatment that saves them pain.

Two or three years later we see indications of decay on the approximal surfaces of the child's permanent incisors. Let us cut it away if we can do so without injury to the appearance of the teeth; but, if the cavities are too deep for this, we can in most cases excavate the cavity from the posterior or palatal surface of the tooth without injury to the labial surface, and here again we may put our trust in gutta-percha for a stopping. And now let me earnestly advise all young practitioners to accustom themselves to work with the mirror. It requires practice for an operator to work from the reflected image in the mirror; but when he has acquired a degree of dexterity in this mode of operating, the work is less fatiguing to himself and to the patient, and a great deal of time is saved in adjusting the chair and appliances. I rarely have occasion to raise the seat of my chair or to change the inclination of the back, as I use the mirror for nearly all my operations on the upper teeth. And to those who will use gold for children's teeth, let me urge care in wedging or pressing the teeth apart with caoutchouc or cotton, and then using the mallet, as many a dead pulp can be traced to this mode of operating. If, still later, the bicuspid—those most troublesome of all teeth to the dentist—decay, I should cut that portion away, leaving a good V-shaped space, if possible, and adhere to the gutta-percha as a stopping, if stopping is necessary.

And now we will suppose the twelfth-year molars to have erupted, and we begin to see the effect upon the teeth of the constitutional changes which precede puberty, the most critical period through which the teeth of a child of average health will have to pass. For the next three or four years the jaw will make but little growth. The mucous membrane is showing greater depth of color, and the oral fluids are becoming viscous,—indications that the mucous secretion is changing in character and increasing in quantity. The teeth are often in that state which is commonly called being on edge, which is simply the action of an acid mucous secretion on the calcareous substance of the teeth; in fact, it is incipient decay. We have so far been fighting decay at every step of development, or perhaps we have, in another case, seen but little of approximal decay, yet the teeth stand in close contact, the canines prominent, and, like veritable wedges, they are forcing room for themselves, and the family history tells us that the teeth of older brothers and sisters have not passed

through this ordeal without showing traces of the battle. If we extract the first permanent molars now, we get a much better result than if we wait a year or two longer, for the gaps caused by their removal will wholly close in nine out of every ten cases if we extract immediately after the eruption of the second molars. So, if we are to resort to this method of gaining space, we ought to decide now; and, although I know this operation is regarded by many of the best men in the profession as a wrong done the patient, I do not think so, and I unhesitatingly say that, with such indications as I have described, it is the duty of the dentist to advise and urge the removal of these teeth at this time. I know, from long experience, that it does prevent decay, and surely our best efforts should be used to prevent disease rather than to cure it. I have performed the operation in many cases, and I have never yet seen cause to regret it; while, on the other hand, in cases where I thought it unnecessary, I have had reason to regret most deeply, when it was too late, that I had not done it. Yet I would not have it supposed that I advocate this operation in all cases. I do not believe in fixed rules of practice. A man must exercise common sense and judgment in every case that comes into his hands, and if he has not these guides to steer his course by, he is not fit to practice on his own account.

It is not my purpose to discuss the causes of the defective structure of the teeth of the present generation; scientific investigation has not been my forte so much as practical and, when possible, painless work. But we know that other organs degenerate if they are not called upon to do the work for which they were intended, and as luxury has increased and food has been more and more delicately prepared, the teeth have certainly had less work to do than those of the savage, which are polished and kept in order by legitimate use, his food not having been prepared by French cooks. The savage has a full, prominent mouth, with a jaw large enough for sixteen well-developed teeth; but the prominent mouth has not been considered a point of beauty in civilized life, and thus, by natural selection, the jaw has been fined down until it is a rare thing to find one with sixteen teeth symmetrically arranged. If all the others are there, the wisdom-teeth will usually have been crowded out of position or delayed in their eruption so long that they are defective and useless; one cusp of the tooth perhaps pierces the gum, and from that moment until it is wholly visible—a process which, as we have all seen, it sometimes takes years to accomplish—the gum is like an open sack, retaining secretions and particles of food, where no brushing or cleansing can remove them; for the gum cannot attach itself to the surface of the enamel, but only to the cementum at the neck of the tooth, and thus the whole crown

of the tooth is sometimes exposed, for a period of months or years, to the action of the more or less injurious fluids or semi-fluids which are forced by the process of mastication through the opening or mouth of the sack that has been made by the eruption of the one cusp. This want of room and consequent retarded advancement of the wisdom-teeth has given them a bad name. They are the "ne'er-do-wells" of the family, and their ultimate salvation is considered hopeless; but I maintain that, in the cases where we extract the first molars and thus give the wisdom-teeth the space they require, they will be, in most cases, as good as the other teeth in structure, though sometimes rudimentary in size, which I take to be another evidence of the fining-down process I have before alluded to. Thus it will be seen that, by the extraction of the first molars at the proper time, we not only give space for the teeth that are anterior to them to separate and so save themselves from approximal decay, but we permit teeth that might otherwise be useless to make themselves serviceable masticators.

From twelve to sixteen years of age, the teeth should be watched most carefully, the gutta-percha fillings should be renewed from time to time if they become worn, and when the patient is sixteen, or as soon as the condition of the oral secretions will permit,—but the age I have mentioned is quite soon enough in England, though in a warmer, drier climate a year or two earlier may be better,—I should begin to make permanent fillings with a good hope of satisfactory results. Although, as I have said before, a man cannot lay down fixed rules of practice, I have generally followed the course I have here sketched for the last twelve years. I have rarely made a gold filling for a patient under sixteen years of age, and the more experience I have the more I am convinced that this is the safest as well as the most comfortable treatment for young people. Sometimes my patients get into other hands, and they are sometimes persuaded that I have neglected them; but the number of those who, having followed my instructions, are dissatisfied with the result is very small.

Discussion.

Dr. B. Lord. The paper read to us this evening from our friend across the water has much in it that is truly good and highly suggestive and practical.

The title itself has great interest in it, as it suggests that which should be the basis of all dental practice, but the author discusses the treatment of existing caries rather than prevention. He don't go far enough back to begin his treatment; he waits too long,—until the enemy is upon him. We ought to begin by cutting away the temporary molars from the first permanent teeth; indeed, we might go

back of that and separate the temporary teeth, to prevent decay on the approximal surfaces.

The paper does not have enough to say about treatment that should precede caries, as a means of prevention. I have great faith in that treatment which looks to the prevention of the disease that we have to battle with. I believe that will be the future dentistry, and I wish I was young again so as to enjoy it. It is found in separating, or properly shaping the approximal surfaces, so that they will be, mostly, self-cleansing. And this can be done, if it is done in time and properly, so as not to make the teeth sensitive, or cause the food to wedge between them and against the gum.

As regards the treatment of incipient decay, by cutting it out or away, in order to arrest its further effects, I do not have much confidence in it, if the decay has extended through the enamel and into the dentine. It will answer for any dense tooth-structure, but often the teeth are rendered very sensitive, and if the spaces are not so shaped that the surfaces will be kept polished by use, the dentine will continue to soften.

The practice of using gutta-percha as a temporary stopping in the teeth of children and youth is unquestionably a good one for the reasons given, particularly in teeth that are soft in their structure, and hence more liable to further decay.

I cannot agree with the paper in its recommendation to extract, so generally, the first permanent molars. They are unquestionably the most important teeth in the arch in preserving its natural size and shape, and in preserving the teeth in their natural strength and position.

Then, if these teeth are removed in quite early life in order to allow the remaining teeth to separate, we do not find this result always or even generally attained, as the teeth come together and will decay, as before, from contact, unless separations are made. How often we see so much lopping of the remaining molars and bicuspids as to occasion great loss of grinding surface; and by this shortening undue force is brought upon the front teeth, and with very unfortunate consequences.

If, as I have said, we begin with these teeth in time, and prevent caries on the surface in contact with the temporary molars, we are all right, as decay arising from imperfections in the grinding surfaces, and sometimes on the buccal surface, can be stopped as readily as such cavities in any of the other teeth, as a rule. But if these teeth come to us already very much decayed, and perhaps with pulps exposed, I say, break away the corners or sides of the crowns,—not build them up,—leaving so much as can be preserved with certainty. And if it should be that we cannot keep any part of the crown, I believe

we should allow the roots to remain as long as they will, in a healthy condition, to maintain the integrity of the parts and the other teeth.

The paper very properly indicates that no fixed rules will apply to all cases, but that judgment and common sense must be exercised in order that we may be of the greatest service to our patients.

Dr. C. E. Francis. Dr. Quinby, in his paper, says, "There is no fixed rule to govern us in all cases." That I believe; we must exercise judgment and discretion. Many cases come to us for treatment that puzzle us exceedingly, and we are sometimes at a loss to know just what course of treatment to pursue. I have in mind a case where a young school-girl was brought to me, some few years ago, whose teeth were badly crowded and all out of proper line. It troubled me not a little to know what to do with them. After pondering the matter over in my mind, I finally concluded to advise the extraction of the four sixth-year molars, they being slightly decayed and the poorest teeth in the mouth. I believed this would save many approximal cavities from forming, and enable the child to better care for her teeth. The four molars were removed, and a very little labor in the way of regulating made their arrangement perfect. I had the pleasure of seeing this young lady yesterday, and examined her teeth. Several minute cavities on the grinding surfaces of the twelfth-year molars and bicuspid's have been filled since her teeth were regulated. As I looked into her mouth yesterday I thought I never before looked into a prettier mouth. There were twenty-eight healthy teeth, beautifully arranged. The wisdom-teeth were through, and just showing signs of decay. A fine searching-point disclosed a small pit on the grinding surface of each, which I filled. There were no signs of approximal decay. I think I never saw a more perfect denture than she possesses.

I will relate another case quite different. This afternoon a young man called on me who some years ago had his sixth-year molars all extracted. In this case I consider that the operation was a great error. There apparently was plenty of room to have retained them all, and the teeth were strong and good. They were badly spread apart. I do not know who removed the molars, but I think it was poor judgment, as in this case they should not have been extracted, for there was no necessity for it.

Dr. Kingsley. Were the remaining molars in the first case tipped forward?

Dr. Francis. Not tipped one atom.

Dr. Kingsley. The objection made to extracting the sixth-year molars because the twelfth-year molars are tipped out of place did not hold good?

Dr. Francis. Not at all.

Dr. Kingsley. Does that objection hold good in the second case?

Dr. Francis. Yes; the teeth all seemed tipped out of place.

Dr. S. G. Perry. I have been heretofore somewhat prejudiced against Dr. Clowes because of his free use of amalgam and his habit of extracting the sixth-year molars. But I am glad to be able to do him the justice of describing a case that I recently saw in his office wherein that combined treatment had produced a most beautiful result. The case was that of a young lady of about twenty-five years of age. At about the twelfth year he had extracted the sixth-year molars. As might be expected, the bicuspid and molars were in contact and standing upright. On every approximal surface back of the canines he had made permanent separations in anticipation of decay. The separations were made about equally on the buccal and lingual sides, and carried close down to the gum, at which place there was a firm point of contact of the smallest possible size. In no instance had the separation been carried through to the gum, and, in consequence, in no space was there the slightest irritation of that tissue, for it had not been in the least disturbed from its normal state. The separations were free enough to be self-cleansing. It was not necessary to ask the young lady if there was any discomfort, for the enamel was not cut through, and there was no sign of the lodgment of food. She stated, however, that she had perfect comfort from the teeth.

The cut surfaces were finely polished, and in every instance free from decay. As all the fissures in the molars and the fissures in the upper bicuspid were filled, it could hardly be said that this freedom from decay on the approximal surfaces was due to the good quality of the teeth. Judging by the number of these crown fillings, and the general appearance of the mouth, I cannot believe that any fair-minded, closely-observing man could escape the conviction that, had the approximal surfaces been left fully in contact, there would have been decay upon them before this time.

The cavities in the molars were mostly filled with amalgam, but the fissures were cut out to their extremities, and the fillings appeared as if they would last for life. The fissures in the bicuspid were filled with gold, and as finely filled and finished as can be done by any modern means. If any one supposes Dr. Clowes uses so much amalgam because he cannot use gold well, a glance at these fillings would convince him of his error. He assured me that this was not an exceptional case, but only one of many such that he could show.

I saw at the same time the young lady's sister, a girl about thirteen. For her he had extracted the sixth-year molars, and already the bicuspid were in condition to be safe from approximal decay for years to come. Several of her incisors had decayed, but he had cut them

freely away on the under side, and so filled them that no one would suppose that they were filled. The distal under side of the right central he had "beveled," in anticipation of decay. The adjoining lateral was already handsomely filled. The work was done in such a way that, no matter how strong a prejudice one might have against such cutting, it must be admitted that the teeth were safe. And certainly they were not deformed, so completely had the work been done on the under side.

It has been my practice to endeavor to save the sixth-year molars, but I must say that in some cases, where the teeth were so badly decayed that I have been forced to extract them, and where it has been done at the right time, most happy results have followed. If done at about the twelfth to the thirteenth year, I have found that from about the fourteenth to the eighteenth year (the period of rapid decay) the bicuspsids, and sometimes even the incisors, spread slightly, and the approximal surfaces are safe. Then, at about the twentieth year, the wisdom-teeth come in and drive the second molars and bicuspsids together, and a good denture is secured for life. As I have grown older, the conviction has been forced upon my mind that occasionally a great good can be done by the deliberate extraction of the sixth-year molars.

It seems to me that Dr. Quinby does not commence early enough. It has been my habit for some time past to ask to have the care of the children who come under my control as early as four or five years of age. Then between the molars, above and below, if there are indications of future decay, I make free separations with a disk. I also cut away the posterior surfaces of the last molars, leaving shoulders at the gum, so as to secure clear surfaces for the first molars; this being done, of course, with a view of saving the sixth-year molars. Following this plan with the temporary teeth, I must say I have found it possible to leave the teeth so that the decay is checked, and in such a manner that mastication is not interfered with, because the gum is not disturbed. It can be done in a few moments, and almost invariably without the occurrence of decay that might otherwise be looked for. The separation is a very free one, so that it is self-cleansing, and is carried as near as possible to the gum and yet without cutting through the enamel, so that there is no discomfort. I will say that my experience in cutting children's teeth has led me to feel that we have yet something to do in the matter of anticipating decay in certain classes of permanent teeth.

Dr. G. A. Mills. I have taken issue sometimes with Dr. Clowes because he has asserted so strongly that he gave all kinds of teeth his method of separation. I have seen many cases where the teeth have been separated that, in my judgment, did not require it. We

all know that many teeth do not indicate this predisposition to decay. Yet I do think there is a modicum of rationality in the practice, requiring the judgment and the discrimination of the operator to determine when and where to put it into practice. Certainly the paper as read, has some good suggestions embodied in it,—not at all new, however, but worth repeating. The extraction of sixth-year molars should not be thoughtlessly done; time and circumstances should be taken into consideration to secure good results. I had a lad in my office to-day whose teeth indicate a decided lack of judgment in the extraction of these molars; they were taken out to prevent decay,—no over-crowded condition was apparent. The twelfth-year molars were in good position, but the bicuspsids were all much out of place, with an excess of space between them. Yet there was extensive decay on the approximal surfaces, two pulps exposed, and one dead, causing a swollen face. Age of patient, sixteen, and of cleanly habits. I quite agree generally with the views expressed by Dr. Lord. The practice of filling cavities in young teeth with metal comes under the same qualifications as other practices previously referred to. While many young teeth will receive metal fillings kindly, it would be very unwise to subject others to the same treatment.

Dr. A. H. Brockway. About the only criticism I should make upon the paper is the one Dr. Perry has indicated, that the essayist does not begin early enough. I consider the paper in the main a very sensible one. The practice indicated corresponds very nearly with what I have pursued, for the past few years at least. I confess that I shared with others in the prejudice against extracting the sixth-year molars under almost all circumstances. But observation and experience have shown satisfactorily to my mind, that cases are not rare in which the best results for the patient can only be secured by a removal of the sixth-year molars. I don't recollect a case in which the sixth-year molars have been extracted at the proper time, say as early as the twelfth year, in which the tipping that has been complained of has occurred. I have in some few cases practiced the method mentioned by Dr. Lord, of cutting off the crown of the tooth and allowing the roots to remain; but the results have not been such as to recommend the practice very strongly. I should prefer, in cases where the sixth-year molars were to be ultimately removed, to take them out before the twelfth year.

Dr. W. H. Dwinelle. The sixth-year teeth being the largest of all the molars, and being appointed to the post of honor of bridging over the critical and dangerous cavity between youth and maturity, and to make normal mastication possible while the temporary teeth pass away and are succeeded by the permanent ones, make the deduction clear and emphatic in my mind that it was the intention of the Cre-

ator that they should remain in the maxillæ as long as any of the teeth. Unfortunately, they are continually associated and classified with the temporary teeth, and too often are left to share their common neglect and common fate. If they were taken in time, were properly cared for and protected until the softer quality of youth were consolidated and crystallized by the years of comparative maturity, their chance of life and usefulness would be equal if not above the rest.

We all know how the removal of the sixth-year molars is apt to break up the articulation, and we know the consequences of it in contracted arches and permanent irregularities. I lately had the opportunity of examining some forty or fifty prepared adult skulls in one collection. With slight exception, the denture was complete in all of them. The sixth-year teeth were as perfect as any of the other molars, and many of them had been in their place for nearly half a century, vindicating and justifying their rightful place there. Who shall say that the common good of the rest demanded their extraction "just before the eruption of the twelfth-year teeth"? Is it not the veriest nonsense to prescribe that sixth-year molars should be extracted at a certain time? Yea, verily!

Dr. J. B. Rich. Some gentlemen say we don't go far enough back, and have indicated where we ought to commence. That is not far enough back if you want to produce fine teeth. The time to commence is long before the children are born. Make a good laboratory, take good care of it, and supply it with good material, then you will have fine teeth, and you will have sixth-year molars that you will be glad to see remain in the mouth.

A few words upon the subject of separating teeth. Cases present themselves where separation is the salvation of the teeth in that mouth. Again, we see mouths in which the teeth are well formed, and where there is no necessity for separation. With teeth that are narrow at the neck and largest at the crown, separation is almost necessary, for such teeth always offer spaces for the lodgment of substances that will decompose and cause decay, and such teeth ought to be so cut away as to present spaces shaped like the mould-board of a plow, so as to be self-cleansing. Men sometimes have theories which amount to hobbies, but with a certain amount of truth for the starting-point. Such a man is our friend Dr. Clowes. There is some truth in what he says about separating teeth and the extraction of the sixth-year molar, and it is a hobby only when it is carried to the extreme that he advocates. We should use a great deal of judgment about extracting the sixth-year molars. It is a bad theory that says "pull them out." I should prefer to keep them in the mouth, even if I had to take the crown away and leave the roots in. Delicate teeth, poorly calcified, must be kept apart.

Teeth of good, dense structure, well calcified, and that kind which our judgment and experience tells us is a desirable sort of tooth-bone, do not need to be cut away. I object to the use of gutta-percha in children's teeth as a filling material, for I have never seen any gutta-percha strong enough to stand the wear of mastication. It is rare that you find parents who will bring their children back to us often enough to have the cavities kept full.

Dr. B. Lord. Do I understand Dr. Rich that he would separate teeth that are so shaped that there are spaces at the necks?

Dr. Rich. Yes, sir; that is what I said.

Dr. B. Lord. I should suppose they were just the teeth not to touch. The tooth-pick could be passed between them readily; there is a point of contact at the grinding surfaces and cutting edges that would prevent food from crowding between them. I should regard them as a very fine shape, and such teeth very rarely decay, and if I should separate them at all, I would enlarge that space near the gum with a file. It is teeth that have parallel sides and have broad surfaces in contact that I would separate from the grinding and cutting surfaces.

Dr. J. W. Clowes. As my name has been taken in vain, I feel it necessary to say a few words. If there is any man here less given to hobbies than another, I claim to be that man. Of filling materials I have asserted there are five,—each equally good in its appropriate place. Had I declared any one of them, to the exclusion of the others, the only reliable substance, the hobby would have been apparent. Had I said the sixth-year molars must *always* be extracted, without the conditions of propriety and judgment, the head of the small horse would be visible. Had I affirmed that any one system of practice was perfect while all others were worthless, the neigh of the animal would be extremely audible. Instead of this, I claim to be eclectic in my practice, and reach forth in every direction to the attainment of good, and with much pleasure bear witness to the saving excellence of extremes,—the wide and permanent separation on the one hand and the contact of golden contours on the other! My friend says we do not go back far enough. That we must tell fathers and mothers what to do. That they must eat bread from unbolted flour,—that they must mind their ways and live godly and wholesome lives, to the end that their children may have strong teeth. This is all very beautiful in theory,—but who is going to reduce it to practice? Who will follow our advice after we have given it? Will they eat and drink to compliment us? I have done much in the admonition line for many years,—I have been very earnest, and employed impressive language, but in the main my breath was wasted in fruitless endeavor. Doubtless I shall continue

in this course to the end, because it is a professional duty, and my reward will be in the consciousness of having performed it. When I ask the average patient to pick his teeth, after meals, with a quill, and tell him it is the only tooth-pick deserving the name,—placing at the same time one, well shaped, in his possession, with the added remark that in its use he will find a good and true friend, the chances are ten to one he will chew it up before leaving the house; and if he should ever think to get another, it will be in the form and substance of a miniature stick of wood! The heartless indifference of those whom we would but cannot bless is passing strange! Although our patients (with rare exceptions) will not do what is best for themselves, we must not falter or give up the battle on our side. We cannot brush and pick and rinse their teeth, but we can so devise and shape conditions that the inimical forces will be disturbed and hindered in their work. *The teeth must be so separated that in the very act of mastication they will work out their own salvation.* Our patients may not obey our behests, but there is a call for nourishment and life that must be answered. *They must wag their jaws, and by that act accomplish a change essential to safety.* The sanitary conditions of separation are greatly promoted by the *extraction of sixth-year molars.* The beneficent result of this action was seen by Dr. Perry in the younger case which I exhibited to him. In this there were only two points of dangerous contact,—between the upper central and lateral incisors,—and these were already seriously decayed. You recollect them, Dr. Perry?

Dr. Perry. Yes, sir; and they were beautifully filled.

Dr. Clowes. The remainder of this denture was naturally separate and without approximal defect,—a marvel wrought within nine months by extraction alone. By this all the teeth (though congenitally weak) were given strength,—danger was averted, disease prevented, and permanence assured. By this, in the years to come, opportunities for care may be improved,—acids from decomposition annulled, and a righteous practice, through beauty, health, content, be justified.

Dr. S. G. Perry. Dr. Rich's advice to mothers is good if they would only take it. But few of them will send their children as often as they are requested to do. Dr. Rich admits that when he says gutta-percha cannot be trusted as a filling for young persons, because they will not come back to have it removed. We all know they will not. We must take patients as we find them, and do for them the best we can when we have them in hand. It is a hopeless task to undertake such radical reforms.

The desirability of permanent separations does not depend entirely upon the shape of the teeth. There are other considerations

that are likely to be lost sight of by careless operators, namely, the age of the patient and the occlusion of the teeth. If the wisdom-teeth are not erupted and the occlusion not permanent and favorable, we run great risk in completely separating the narrow-necked teeth. I cannot believe that the narrow-necked teeth are the most favorable class for separations. I have been more successful with the short teeth with large necks, separating them so as to leave a firm point of contact close to the gum. If it can be done so as not to disturb their relations to each other, and so as not to expose the gum, there may be a clear gain, since the abutment at the gum presents a minimum point of contact. If the V-shaped separation be avoided, and the U-shaped cut be substituted, there may be safety.

Dr. J. L. Williams, Boston. I have been quite interested this evening in the subject of separating the teeth, but there is one point that I have not yet heard touched upon. The space made in separating is usually described as being larger towards the lingual side than towards the buccal; but you will notice in the natural teeth the buccal cusps of the lower molars and bicuspid strike inside of the cusps of the upper ones. This naturally tends to force the food into the space, rather than out of it, if it is shaped as usually recommended. Now, a space between the upper bicuspid or molars, to be self-cleansing in the greatest degree, should have its narrowest part towards the lingual portion of the tooth. To be sure, the bicuspid would be a little disfigured by this shaped space; but by keeping the natural outline of the first bicuspid, and slanting the line of the second bicuspid, we shall get a space through which the food will be forced outward towards the cheek during mastication and present but slight disfigurement of the teeth. Between lower bicuspid or molars the large end of the V should be on the lingual side of the teeth.

Adjourned.

The annual meeting of the New York Odontological Society was held at the residence of Dr. W. A. Bronson, Tuesday evening, December 9, 1879, at which the following officers were elected for the ensuing year:

President.—W. A. Bronson.

Vice-President.—William Jarvie, Jr.

Recording Secretary.—S. G. Perry.

Corresponding Secretary.—C. E. Francis.

Treasurer.—Charles Miller.

Librarian.—E. G. Roy.

Curator.—C. A. Woodward.

Executive Committee.—A. L. Northrop, E. A. Bogue, O. E. Hill.

NEW YORK SOCIETY OF DENTAL AND ORAL SURGEONS.

A SOCIETY under the above title was organized January 5, 1880, at the residence of Dr. J. B. Lawrence, No. 14 East One Hundred and Twenty-Ninth Street, New York, to meet the first Monday of each month. The following officers were elected :

President.—J. B. Lawrence.

Vice-President.—F. Milton Smith.

Recording Secretary.—Daniel E. Morse.

Corresponding Secretary.—Victor H. Jackson.

Treasurer.—Henry G. Marshall.

VICTOR H. JACKSON,

Corresponding Secretary.

ALUMNI ASSOCIATION OF THE BALTIMORE COLLEGE OF DENTAL SURGERY.

THE annual meeting of the Alumni of the Baltimore College of Dental Surgery will be held in the lecture-room on Thursday, March 4, 1880, at ten o'clock A.M.

WM. A. MILLS, *Recording Secretary.*

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

THE twenty-fourth annual commencement of the Pennsylvania College of Dental Surgery was held at the American Academy of Music, Philadelphia, Friday, February 27, 1880, at twelve o'clock.

The address to the graduates was delivered by Professor C. N. Peirce, D.D.S.; the valedictory by W. E. Van Orsdel, D.D.S., of the graduating class.

The number of matriculates for the session was one hundred and twenty-six.

The degree of D.D.S. was conferred on the following graduates by Dr. S. D. Gross, President of the Board of Trustees :

NAME.	RESIDENCE.	NAME.	RESIDENCE.
D. D. Atkinson.....	Georgia.	John B. Dewees.....	Ohio.
Lewis S. Ayers.....	New Jersey	B. K. Fetzer.....	Germany.
M. Allman.....	Pennsylvania.	C. K. Fiske.....	Canada.
William C. Barrett.....	New York.	Emil Fuerth.....	Pennsylvania.
F. W. Bennett.....	Illinois.	Eugene Goebell.....	Germany.
Adolphe Betancourt.....	Louisiana.	C. H. Goodrich.....	Minnesota.
L. J. Blanchard, M.D....	Maine.	Samuel A. Graham, Jr....	Maryland.
J. Henry Boger.....	Pennsylvania.	John F. Hain.....	Pennsylvania.
Charles R. Brady.....	Pennsylvania.	H. R. Harbison.....	Pennsylvania.
Rafael Chaguaceda.....	Cuba.	C. J. Hazard.....	New Jersey.
Horace M. Christy.....	Pennsylvania.	Thomas K. Heaton.....	Pennsylvania.
R. L. Culpeper.....	West Indies.	C. T. Hewes.....	Illinois.
L. F. Dayan.....	New York.	J. Calder Hinkle.....	Pennsylvania.
Afonso H. DeMoura.....	Brazil.	G. W. Hosterman.....	Pennsylvania.

NAME.	RESIDENCE.	NAME.	RESIDENCE.
T. L. James.....	Iowa.	Jacob Perkins.....	Pennsylvania.
R. E. Johnson.....	Ohio.	W. A. Phreaner.....	Pennsylvania.
W. S. King.....	Tennessee.	W. M. Risdon.....	New Jersey.
Clara Kuhnast.....	Germany.	James W. Scott.....	Pennsylvania.
J. E. Libby.....	Pennsylvania.	W. K. Sheaffer.....	Pennsylvania.
John H. Lloyd.....	Pennsylvania.	William G. Smith.....	Maryland.
H. S. Lowry.....	Ohio.	J. A. Suarez.....	Cuba.
F. S. Maxwell.....	Ohio.	Robert F. Swain.....	Pennsylvania.
C. H. McCowan.....	Pennsylvania.	D. S. Thomas.....	Pennsylvania.
Louis A. Melze.....	Michigan.	J. L. Tierney.....	Pennsylvania.
F. M. Miller.....	Kentucky.	W. E. Van Orsdel.....	Pennsylvania.
Walter H. Neall.....	Pennsylvania.	H. L. Whitbeck.....	New York.
F. R. Newcomb.....	Pennsylvania.	F. D. Winchester.....	Illinois.
C. E. Paddock.....	Ohio.	E. N. Woodward.....	California.
Harry Zimmerman.....	Pennsylvania.		

PHILADELPHIA DENTAL COLLEGE.

THE seventeenth annual commencement of the Philadelphia Dental College was held at the Academy of Music, Philadelphia, Friday evening, February 27, 1880.

The address to the graduates was delivered by Professor D. D. Smith, M.D., D.D.S.; the valedictory by W. J. Bowden, D.D.S., of the graduating class.

The number of matriculates for the session was eighty-eight.

The degree of D.D.S. was conferred on the following graduates by Hon. James Pollock, President of the Board of Trustees:

NAME.	RESIDENCE.	THESIS.
Napoleon B. Avery.....	Oregon.....	Dental Caries.
William J. Bowden.....	Ireland.....	Conservative Treatment of the Pulp.
Jacob S. Brandt.....	Pennsylvania.....	Dental Caries.
Winslow L. Church.....	Rhode Island.....	Dental Caries.
Edward G. Clark.....	Oregon.....	Conservative Treatment of the Pulp.
William E. Davie.....	New Jersey.....	Continuous-Gum Work.
Fred. I. Drowne.....	Massachusetts.....	Continuous-Gum Work.
Ferdinand Egger.....	Germany.....	Eruption of the Teeth.
James A. Finney.....	Pennsylvania.....	Digestion.
Clarence E. Gates.....	Massachusetts.....	Treatment of Teeth with Devitalized Pulps.
S. Eldred Gilbert.....	Pennsylvania.....	Anæsthetics.
Oscar J. Gross.....	New Hampshire.....	Materials and Methods employed in taking Impressions of the Mouth.
Alvin C. Harding.....	Nova Scotia.....	Continuous-Gum.
John A. Hartmann.....	Pennsylvania.....	Digestion.
John V. Hemstreet.....	New York.....	Dental Caries.
Reuben Herrod.....	Pennsylvania.....	Construction of Artificial Dentures.
Alfred Hosfeld.....	Pennsylvania.....	Chemistry as applied to Dentistry.
Harvey Iredell.....	New Jersey.....	The Blood.
Albert H. Lewis.....	Pennsylvania.....	Disease.
William H. Marshall.....	Mississippi.....	Dental Caries.
Milton C. Marshall.....	Mississippi.....	Gold as a Filling Material.
J. Clyde Macartney.....	Pennsylvania.....	Filling Materials.
Charles W. McConnell.....	Rhode Island.....	Gold as a Filling Material.
W. Addison McKelvy.....	Pennsylvania.....	Eruption of the Deciduous Teeth.
Morton R. Metcalf.....	Minnesota.....	Caries of the Teeth.

NAME.	RESIDENCE.	THESIS.
Samuel A. Milton.....	Missouri.....	Conservative Treatment of the Pulp
Charles A. Page.....	Pennsylvania	Circulation of the Blood.
Walter Peake.....	England.....	Plastic Materials for Filling Teeth.
Fred. M. Smith.....	New York.....	General Principles of Nutrition.
S. Goode Thomson.....	South Carolina...	The Fifth Pair of Nerves.
Edwin R. Varcoe.....	New York.....	Preparation of Mouth for Artificial Dentures.
William R. Webb.....	Pennsylvania	Sensitive Dentine.

NEW YORK COLLEGE OF DENTISTRY.

THE fourteenth annual commencement of the New York College of Dentistry was held at Chickering Hall, Tuesday, February 24, 1880, at eight o'clock P.M.

The address to the graduates was delivered by Rev. John P. Newman, D.D.; the valedictory by Edwin W. Knickerbocker, of the graduating class.

The number of matriculates for the session was ninety-three.

The degree of D.D.S. was conferred by Dr. William H. Allen, President of the Board of Trustees, on the following graduates. The theses consisted of written answers to questions by the Faculty.

NAME.	RESIDENCE.	NAME.	RESIDENCE.
Bernabe Arteaga.....	Cuba.	Herman Lambert.....	Poland.
Virgilio Barranco.....	Cuba.	Bryant Chas. Magennes..	New Jersey.
Hans F. L. Brauer.....	Germany.	E. W. Knickerbocker....	New York.
Albert Jewett Butler....	New York.	M. L. Obrieght.....	New York.
Emilio Dolores Costales..	Cuba.	August L. Peters.....	New York.
Wm. Curtis Deane.....	New York.	George Willis Price.....	California.
Wm. F. Davenport.....	New York.	Sherman B. Price.....	Connecticut.
Ewald O. H. Elsner.....	Germany.	Antonio B. Primo.....	Brazil.
Alfred Wells Edwards...	France.	David K. Reinhold.....	New York.
Wm. French Gerrish.....	Rhode Island.	Zachary T. Sailer.....	New Jersey.
Karl Grosch.....	Germany.	Alfred Russell Starr....	New York.
Karl A. W. Herrmann...	Germany.	Wm. Elston Stelle.....	Pennsylvania.
Frank Latson.....	New York.	Oscar Schneider.....	Germany.
Wm. Erik Lindstedt.....	New Jersey.	George A. Warkley.....	Massachusetts.

EDITORIAL.

"APPROXIMAL" OR "PROXIMATE."

JAMES W. WHITE, M.D., EDITOR "DENTAL COSMOS."

DEAR SIR,—The effort you have made towards settling upon a term which may be generally satisfactory for designating the contiguous surfaces of adjoining teeth is certainly a laudable one. It is of comparatively recent date that the very frequent use of such a term has become important. The surfaces of the teeth referred to attracted formerly no great amount of attention, and an exact term was a matter of less consequence than it has now become. The general

term as used by the older, and indeed some modern writers, was "lateral" or "contiguous," except when a particular surface was under discussion. Your examination of the terms employed for the purpose in question by different writers appears to me to be exhaustive, and should be conclusive. By a course of clear and logical reasoning you came to the conclusion to adopt the word "proximate" as the standard in this particular for the DENTAL COSMOS.

The change in your views, as stated in the concluding paragraph of your editorial, to the extent of inducing you to recommend the employment of the word "approximal," which you had discarded in favor of "proximate," you attribute to the communication, in reference to the question, of Dr. Joseph Thomas, which you publish. As you open the pages of the DENTAL COSMOS for the discussion of this question, I propose briefly to examine the reasons offered by Dr. Thomas in favor of the employment of the word "approximal," and to endeavor to show that they are not sufficiently strong to justify general approval of his opinion. No one will attempt to dispute anything contained in the opening paragraph of Dr. Thomas's letter, viz.:

"That every true scientist will admit that in scientific statements or descriptions precision or exactness of language is of the very first importance; for without precision of language it is impossible to impart exact and accurate knowledge." His further statement, that "It is not enough that the words employed should convey a tolerably correct idea to one who is already acquainted with the subject; they should be such as would not be likely to mislead or confuse the uninitiated," will meet unqualified assent. The question at issue may be determined in strict accordance with these principles.

Dr. Thomas discards, as you have done, the word "proximal," and for the same reason, viz., its use in a special anatomical sense. He says that "The same objection, though in a far less degree, might perhaps be urged against the use of 'proximate,' in the signification just referred to." This, probably, does not clearly state his exact meaning, but as I understand it, his view will not be generally admitted. He does not find any serious objection to its use for the purpose in question by its appropriation in the way of any other scientific application.

"But," he says, "there cannot be the slightest objection to employing the word 'approximal' for such a purpose." This is a proposition to which I cannot assent.

No question has been raised by any one as to the fact that the term "proximate," presents with "accuracy" and "precision" the idea sought to be conveyed. No objection has ever been made to the propriety of the use of the word for the purpose in question; none is made now. It is already familiar to readers of dental works, and there are no doubts with regard to its exact meaning.

The word "approximal" has been employed but by one author of any extended treatise. Its employment has been declined, as a general rule, by writers upon dental subjects, after it has been offered to them for more than thirty years. It can scarcely be said that there is no objection to a term the use of which has been persistently declined for so long a time.

"Approximal" is a word which has no admitted existence in any language. It therefore conveys no meaning to a reader who meets with it for the first time. He refers to the usual sources of information in such a case, and fails to find the word in any dictionary. For this reason it is open to serious objection on the grounds stated by Dr. Thomas, and quoted above. It lacks "precision" and "exactness," and would "mislead or confuse the uninitiated." This objection should be fatal to its employment. The mere termination of the word

bringing it into uniformity with some other dental terms seems to be of but little importance in view of other considerations. "In scientific statements or descriptions precision or exactness is of the very first importance." For this reason, if the word "approximal" has about it a shadow of obscurity, as compared with "proximate," it should be rejected. There is, indeed, a surface of molar or bicuspid teeth to which a term is applied not having the advantage of this termination, viz., the grinding or masticating surface.

Yours, very truly,

R. ARTHUR.

BALTIMORE, February 16, 1880.

We are glad that our presentation of the subject has awakened discussion as to the proper name for contiguous surfaces, and we take pleasure in publishing the foregoing communication from so distinguished a member of the profession as Dr. Arthur.

So far as "proximate" is concerned, our course in employing it for several years to the exclusion of other terms is sufficient indication of our view of its fitness, provided a better cannot be substituted. So much being granted, it remains only to inquire if "approximal" is a more suitable word than "proximate,"—"proximal" and "approximate" being obviously out of the question.

The chief merit of "approximal" is that which Dr. Arthur seems to consider its greatest weakness,—having apparently "no admitted existence in any language." So far as we are aware it has never been used for any purpose except the designation of contiguous surfaces of adjoining teeth, while each of the others has a well-understood technical use in other directions. "Approximal," if it is anything, is a purely dental term, and can readily be limited to its dental signification.

Dr. Arthur overlooks the fact that dentists and dental students in this country, at least, are almost without exception familiar with Harris's "Principles and Practice," inasmuch as it is a recognized text-book in all the colleges, and is also among the first treatises recommended to the student by his preceptor. Another fact which is worthy of consideration is that "approximal" is constantly met with in the journals. Up to the time when "proximate" was adopted as the standard for the DENTAL COSMOS, "approximal" frequently appeared in its pages, and since that date many articles have been received in which it was employed by the writers. All of which goes to show that there is a pretty widely-spread knowledge of its use and signification. Certainly its meaning is not involved in obscurity.

It must be remembered that the "usual sources of information in such a case" (Webster's and Worcester's dictionaries) represent the state of the language at the time of their last revision, some fifteen years since. During that period many new words have been adopted

with the sanction of the very highest authority, none of them being found in any dictionary. We have before pointed out that the probable reason why "approximal" fails to appear in either of the standard authorities is that Harris, though using it constantly in his text-book, neglected to incorporate it into his "Dictionary of Dental Terminology." This work, it would reasonably be supposed, would contain everything in the way of special technology which its author had found valuable; hence, its information being in a much more accessible form, it would naturally be consulted on special dental nomenclature in preference to the text-book. The oversight can be readily corrected when the progress of the language renders another revised edition of the dictionaries necessary. This when made will certainly include hundreds of words familiar to all scientific readers, but which have not as yet appeared in any dictionary.

Meanwhile, we hope that the subject will receive the consideration which its importance demands. In this connection our attention has been called by a correspondent to the medical use of the term "distal,"—the aspect of a bone from the trunk or towards the extremity. It would seem indeed that this word was also pre-empted.

DENTAL LEGISLATION IN NEW JERSEY.

THE following supplement to an act entitled "An act to regulate the practice of dentistry, and to protect the people against empiricism in relation thereto in the State of New Jersey," was passed February 10, 1880:

1. BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*, That from and after the passage of this act, it shall be unlawful for any person to engage in the practice of dentistry in the State of New Jersey, unless said person has pursued a regular course of instruction for at least one year in a reputable dental college chartered under the authority of some one of the United States or foreign governments, and has graduated and received a diploma from such college, or unless the said person shall have obtained a certificate from a board of dentists duly authorized and appointed by this act to issue such certificates, and shall have registered his name and the name of the said dental college or board of dentists in the county clerk's office of the county in which he shall have engaged in the practice of dentistry, within one month after commencing such practice, in a book to be provided and kept for that purpose, in the several county clerk's offices of the several counties of this State, and for which registry the said county clerk shall be entitled to demand and receive from each person registering the sum of fifty cents, and any person violating any of the provisions of this act shall be liable to the penalties prescribed in the sixth section of the act to which this is a supplement.

2. *And be it enacted*, That this act shall take effect immediately.

The sixth section of the original act above referred to recites, "That any person who shall, in violation of this act, practice dentistry in the State of New Jersey for a fee or reward, shall be liable to indictment, and on conviction, shall be fined not less than fifty or more than three hundred dollars: *provided*, that nothing in this act shall be construed to prevent any person from extracting teeth; *and provided further*, that none of the provisions of this act shall apply to regular licensed physicians and surgeons."

PERSONAL.

DR. EDWARD CLAY WISE has received the diploma in dentistry of the Escuela de Medicina of the Republic of Mexico, being the first American graduate of this institution.

BIBLIOGRAPHICAL.

SORE THROAT: ITS NATURE, VARIETIES, AND TREATMENT. By PROSSER JAMES, M.D. Fourth edition. Lindsay & Blakiston, 1880.

This is a neatly-printed octavo volume of three hundred and eleven pages, and contains in a compact and readable form a great amount of information about the diseases of the throat and associated parts. The first portion of the book presents a general and comprehensive description of the varieties of sore throat, with their differential diagnosis and treatment, and includes an excellent account of the general methods and principles of laryngoscopy and rhinoscopy. As a valuable specimen of the author's general style, we would call attention to the pages on gargles, which contain an explanation of the *modus operandi* of these time-honored remedies, which is not only scientific and accurate, but at the same time so easily comprehensible as to be almost adapted for popular reading.

The second division of the book is devoted to a consideration of those affections which are not strictly limited by definite anatomical boundaries, and contains the clinical history and treatment of inflammatory, ulcerated, aphthous, granular, fungous, diphtheritic, and syphilitic sore throat. In respect to the latter affection, we think the author rather exaggerates the influence of topical remedies in tertiary ulceration, but this is compensated for by the very judicious advice given later in reference to the administration of iodide of potassium. We have so often seen this drug fail to produce any therapeutic effect

on account of the insufficient doses given, that we are glad to read that "the quantity is to be measured by the effect on the disease and the ability of the patient to bear it."

The third division of the book comprises a consideration of the diseases of individual organs,—the soft palate and uvula, the tonsils, the pharynx, the larynx, the nares, the œsophagus, etc.

The greatest value of the work lies in the unquestioned authority which is conferred upon the author's dictum by years of large experience, and if the tone of the advice given and the condemnation of opposing opinions seem sometimes a little too positive, or even arbitrary, the usefulness of the book as an exposition of the views of one of the foremost laryngoscopists of the day is in nowise impaired thereby. The illustrations are few but good.

THE DENTAL STUDENT'S NOTE-BOOK. By OAKLEY COLES. Second edition. Philadelphia: Presley Blakiston, 1880.

The name of this little volume indicates its character and object. It is a brief but systematic presentation of the facts in connection with the development, structure, comparative anatomy, and pathology of the teeth and the diseases and surgery of the mouth. The generally accepted facts with reference to the development of the enamel, dentine, and cementum; the development of the jaws and alveolar processes in connection with the first and second dentition; the structure of the several dental tissues; the relation of the deciduous to the permanent teeth; the absorption of the temporary teeth and the various lesions to which the teeth, jaws, and associated parts are subject are concisely set forth. It may be styled a pocket-dictionary of the subjects named, convenient as a reference to the student preparing for examination, but too limited in its treatment of the various topics to have much value except for such purposes.

ZAHNÄRZTLICHER ALMANACH, ein alphabetisch geordnetes Namensverzeichnis der im Deutschen Reiche und in Oesterreich-Ungarn, practicirenden Zahnärzte. By ADOLF PETERMANN, D.D.S., etc. Frankfurt am Mein. In Commission bei Johannes Alt. 1880.

The fourth annual issue of Dr. Petermann's register of the dentists of Germany and Austro-Hungary contains, besides the names and addresses, alphabetically arranged, of over six hundred practitioners, interesting information regarding the qualifications for practice, a tabulated list of dentists according to their location, a list of cities of over ten thousand inhabitants without a dentist, etc. Dr. Petermann appears to feel a lively interest in bogus diplomas, and fearlessly exposes the possessors of such to the opprobrium of their more honorable brethren. The book is neatly bound in cloth, with two portraits on steel.

OBITUARY.

ACTION OF THE DENTAL PROFESSION WITH REFERENCE TO
THE DEATH OF DR. SAMUEL S. WHITE.CORPORATORS OF THE PENNSYLVANIA COLLEGE OF DENTAL
SURGERY.

At a meeting of the corporators of the Pennsylvania College of Dental Surgery, held February 24, 1880, the following preamble and resolution were offered by Dr. Wm. W. Fouché, and unanimously adopted:

WHEREAS, It is eminently proper that this Board should express its sense of the loss sustained by the dental profession in the demise of Dr. Samuel S. White; therefore

Resolved, That to his fostering care dental art had been for many years largely indebted, his constant interest in its development contributing in no small degree to the position which it occupies to-day; and that in his death dentistry has lost one of its noblest friends and benefactors.

BROOKLYN DENTAL SOCIETY.

At a regular meeting of the Brooklyn Dental Society held February 9, 1880, the following report of the special committee expressive of the sentiments of the society in relation to the death of Dr. Samuel Stockton White, of Philadelphia, who died in Paris, December 30, 1879, was unanimously adopted:

When the sad intelligence flashed across the sea from a foreign land that death had removed from us our honored friend and brother, in the full maturity of his manhood and the height of his usefulness, our first thought was, Why should such a man, so identified with the interests of our profession, so active and useful in the cause of charity and religion, be taken away at the very summit of his power?

"Death loves a shining mark," and the ways of Providence are incomprehensible; but while we mourn our brother we bow our heads in humility to those decrees which emanate from an All-Seeing Power.

Dr. White was a man whom we had all learned to love and honor for his many manly virtues and sterling integrity. In his death the dental profession has lost one who was always ready to aid any movement for the advancement of its best interests.

Although lately he was not identified with the profession as a practitioner, his position as a manufacturer of the many appliances needful in our practice had brought him in communication with the humblest as well as the highest in our ranks, and all can testify to his clear comprehension of what was necessary for our use, his willingness to aid those struggling in adversity, and his general interest in everything pertaining to the wants of our profession.

The dental profession throughout the world will mourn his loss, our several societies will miss his magnetic influence, and each individual dentist will feel he has lost a friend and brother.

His memory will always be to his family everything that is noble and lovable, and we tender to them our heartfelt sympathy in this hour of their bereavement.

WM. B. HURD,	} Committee.
W. H. ATKINSON,	
H. G. MIRICK,	

C. P. CRANDELL, *Recording Secretary.*

PERISCOPE.

REPLANTING TEETH UNDER A NEW METHOD.—In introducing the subject of returning teeth to their natural sockets after removal, it is necessary to preface my lecture by a few remarks explanatory of the position occupied by me concerning replantation. I perfectly understand the disfavor under which it rests with the profession generally, having patiently followed the arguments so decidedly pronounced against it; and, remembering this, I have carefully pursued my investigations, until I am prompted to ask, Is it not barely possible that Hunter may have advanced the theory of replantation, the outgrowth of his physiological investigations, that has been problematical because not understood? Profound as he was in research, and conspicuous over others in his anatomical experiments, we are compelled to consider this emanation as coming from a source to be respected. That, in the absence of the pulp, the low-conditioned vitality of the tooth-membrane gave him a wide range for thought, culminating in his planting teeth in structures of a similar low-conditioned vitality.

Transplanting is a feature in surgery that seems to have been practiced by him with more than ordinary pleasure. This, however, I believe can never become popular in the hands of any one, even the most careful, owing to the difficulty of finding teeth corresponding in form to those lost. While I cannot indorse the treatment for general practice, there are exceptional cases in which teeth may be transplanted, and prove valuable organs for many years. I can well understand the enthusiasm with which Hunter pursued his investigations upon this subject, and it seems evident he was sincere in the belief that he had made a discovery in surgery that would result in great benefit to humanity. He says, "I consider when this practice is attended with success, there is a living union between the tooth and socket, and that they receive their nourishment through this. My reasons for this supposition were founded on observations made in practice itself, for I observed they kept their color also upon experiments on living animals. I took a sound tooth from a person's head, then made a pretty deep wound with a lancet in the thick part of a cock's comb, and pressed the fang of the tooth into this wound, and fastened it with thread passed through other parts of the comb. The cock was killed some months after, and I injected the head with a very minute injection; the comb was then taken off and put in very weak acid, and the tooth being softened by this means, I split the comb and tooth into two halves, in the long direction of the tooth. I found the vessels of tooth well injected, and observed the external surface of tooth adhered everywhere to comb, by vessels similar to the union of tooth with the gum and socket." I quote this from Hunter's writings, not with a view of advocating the practice of transplanting teeth, but as an argument in favor of replantation under certain conditions of disease; and it would appear that this latter mode of treatment did not originate with Hunter, for it had been practiced prior to the time of his writing upon the subject. My indorsement of replantation extends no further than the confidence inspired from observations where this treatment, in conjunc-

tion with capping and tubing, has been successfully followed when other methods have failed. I would again qualify my remarks by saying that I am a believer in this new mode of practice only to the extent in which I have *seen* beneficial results *practically demonstrated*; and while I am favorably impressed with this treatment in certain cases, it is as yet too new to positively predict any future position it may occupy in the profession. I submit, however, for your consideration this evening a few of the cases that have been under treatment by me in this new way during the last eight months; these number twenty-one. In forty-five other cases I have filled roots and crowns and replanted.

In the opening of these lectures I dwelt very briefly on the histology of the teeth; I shall now revert to it with a view of more fully explaining the conditions under which a tooth having been dismembered from the body may again be re-established to a comparatively normal condition of health; and to better illustrate my remarks I have had this model prepared. The three hard tissues of the tooth are formed of plaster of Paris, the pulp of wax, and the vascular periosteum is glazed on with oil color. No very marked difference in color could be used to distinguish with truthfulness the enamel, the cementum, and the dentine; but I have had the hexagonal prisms of the enamel, the lacunæ and the canaliculi of the cementum, and the interglobular spaces, canaliculi, etc., of the dentine engraved on the sectional surfaces presented to view, so as to give a more comprehensive idea of the tooth-structure.

In the formation of the teeth in the gum covering the previously existing jaws, we see the building up of a remarkable organization, extraneous to the superior and inferior maxillary bones, though secondarily and indirectly united with them to form a part of the oral cavity, and especially to serve the purpose of mastication. Resting in the alveolar process surmounting the jaw, the teeth are surrounded with life-giving tissues up to the commencement of the enamel cap; nerves, arteries,* and veins enter the pulp through the apices of the roots and ramify, intermingle, and interloop themselves in the pulp, supplying pabulum to the dentine, while the process of calcification goes on. Upon the cementum, and between it and the alveolar process, is situate the vascular periosteum; vessels enter the periosteum from the alveolar process, the gum, and the pulp-vessels, and form themselves into a fine network or plexus throughout the whole of its structure.

We see then that the tooth is well cared for, externally as well as internally; and, in a normal condition, the possessor of this exquisite piece of mechanism is scarcely aware of its existence. When, however, caries enters the domain, piercing the citadel of the living pulp, a death-blow is struck to that tissue, and with the loss of the pulp, the periosteal membrane alone is called upon to supply pabulum, apparently necessary to nourish what would be otherwise almost a foreign substance in the jaw. Here again do we see a wonderful provision made by nature in an emergency of this kind, by the periosteum, when not impaired by disease, assuming a long-continued

* It has been questioned by some as to whether the circulation in the pulp is arterial or capillary.

devotion to this portion of the animal economy, which would otherwise be rejected.

The tooth being extracted, the living periosteum with its plexus of microscopic vessels is, in part or entirely, removed with it. The tooth is filled, as will hereafter be described, and in a short time after being returned to its socket adhesion occurs, and the tooth is again nourished, but not to its original perfection, yet sufficient to restore it to usefulness. Circulation in the periosteum is re-established, but whether the pre-existing vessels become the channels of the blood—which is not at all likely—or there is a new system of vessels developed, as in union by adhesive inflammation, is a matter for inquiry.

The reason replantation has not been more generally followed is, perhaps, that up to the present time it has continued experimental in hopeless cases for treatment in the mouth, successes being counterbalanced by failures. In the incipient stages of periostitis leading to alveolar abscess, nature provides a remedy by the process of absorption of the products of inflammation; and in instances of this kind the treatment is simple, being locally and constitutionally antiphlogistic. Such cases can, by the intelligent practitioner, be successfully treated in the mouth; but, in the more aggravated forms of the disease, it is not so easy to arrive at a satisfactory solution of the requirements to meet the exigency of the case. It is more difficult to define the pathological condition that will permit replacement of teeth without drainage; for in these cases we must look for complications beyond and quite remote from the immediate trouble. I here refer more especially to cases where constitutional diseases predominate, such as syphilis; tendencies to necrosis of the jaw, as may be found in workers of phosphorus; sufferers from long-continued use of mercury; and also to a more immediate and sometimes puzzling cause of complaint, namely, exostosis of the apical portion of the roots.

To me this subject has been one of great interest, although I cannot recall my earlier efforts at replanting with any degree of pleasure. I believe, however, that the cases formerly lost might have been saved with my present mode of treatment, for I would not now attempt to replant teeth of a similar character without proper drainage.

The late discussions in Europe have again interested me in the subject, and a few months since I began another series of experiments with better results. Not, however, in the first two attempts, as I lost the teeth in both instances; but the probable causes of failure I shall endeavor to explain further on.

In the April number of the *Monthly Review of Dental Surgery* of this year there is an epitome of Magitot's paper upon replantation of teeth, read before the Odontological Society of Great Britain by Mr. Charles S. Tomes. Following the reading of the paper the subject was fully and ably discussed, resulting in a general declared necessity for an open fistula in severe cases of chronic periostitis,—after replanting,—to permit of drainage, and to re-establish a solid union of the lacerated parts. The importance of this cannot be over-estimated when we consider that a more or less extended inflammation follows the restoration of the tooth to its socket. This inflammation being in part caused by suppressed morbid secretions which nature persistently demands an outlet for, unless a temporary

drainage is established, the tooth is forcibly ejected from its socket. Mr. Tomes very justly remarked "there is no anatomical reason whatever why perfect union of the periosteum should not take place, and doubtless it does take place, so that presumably these replanted teeth may, in the most successful cases, have as much real connection with surrounding parts as any dead tooth has. But there is an accident to which replanted teeth are liable which I do not see how we can contend against, and that is complete absorption of the roots."

It is with a view to preventing this absorption that I have practiced a method of excising a portion of the roots, and restoring the portion so removed with a cap of gold. My first case, one of some eight months' standing, has thus far proved very satisfactory, the patient apparently enjoying all the privileges of a sound tooth. The length of time, however, is not sufficient to warrant the assertion that absorption may not take place. I shall endeavor to watch the several cases so treated, and hope at a later period to give the results in a more decided form to the profession.

Through the kindness of Dr. George W. Field, I am permitted to cite a case that was of long standing, and obstinate to every treatment. The patient was troubled with chronic alveolar abscess, and had been under the doctor's care for a period of six months. In discussing the case with me, I suggested tubing, mentioning that I had been practicing it with very gratifying results. The treatment was adopted by Dr. Field, and he afterwards informed me that a cure had been effected in one sitting.

The success of the operation, however, resolves itself into many considerations, of which the following are some of the more important, viz., a careful diagnosis of the condition of the mouth; health of the patient; resisting strength of the tooth under the forceps; its position, attachments, and relationship to other teeth; formation of the alveolus, whether bulging or not; condition of the crown, roots, etc.; and, after extraction, a careful investigation of the covering membrane of the roots of the tooth to be operated upon.

Difficulty is occasionally experienced in attempting to remove the tooth without fracture to the process; especially is this the case with superior molars: and it also sometimes occurs in extracting lower molars. For this reason the patient is better under the influence of an anæsthetic while the tooth is being removed. After the extraction of the tooth, the socket should be injected with warm carbolyzed water, and within a few moments a tent, made of cotton loosely rolled, conforming in size to the alveolar cavity, and having a silk ligature attached, should be gently introduced into the socket; the ends of the ligature extending outside the orifice of the cavity, so that the cotton may afterwards be easily removed, with no chance of any remaining unrecovered, for this might prove the exciting cause of trismus.

We now come to a consideration of the method of preparing the tooth for its return to the socket. The tooth being successfully removed, I would again call your attention to a careful investigation of the covering membrane of its roots, whether denudation has taken place, and if so, to what extent. Not only must you take into consideration the condition of the roots, but your attention should be

particularly directed to the gum and the process, whether they are healthy, or in a state of atrophy. As the peridental membrane will afterwards be dependent upon these tissues for its nourishment, you may expect to find its condition analogous to that of theirs. You must exercise judgment as to when, and under what circumstances, teeth may be restored to their sockets after removal; for it is not to be supposed that every tooth extracted can be replanted. There are certain stages of disease that will permit a return of the tooth without tubing; but if denudation has commenced previous to removal, the roots should be excised and capped with a view to arresting absorption, or rather to prevent a more rapid waste, for the tooth having once lost its pulp, necessarily undergoes a certain condition of atrophy.

There are also certain conditions under which teeth cannot be tubed; and I am now trying a method of capping in such cases, and obtaining drainage through the alveolar process by making an opening opposite the apex of the root, the results of which I shall give at a later period.

Teeth may sometimes be replaced, when capped, without tubing; but never under any circumstance should I consider it justifiable to tube without capping, on account of the external fracture that would be produced upon the root. In cases of chronic abscess with an open fistula through the gum, where the apical portion of the root is supposed to have lost its periosteum, the tooth should be extracted, and the denuded part excised. The cap may now be filled with gutta-percha, warmed, and gently pressed to its position, thereby preventing the secretions from coming in contact with the end of the root after its return. Great care should be taken that the tooth is restored to very nearly its original length; the cap to be made of pure gold, and oviform; while the edges should be very thin, so that they may pass over the end of the root, and if possible underneath the periosteal membrane. The tooth can then be replaced, the fistula answering the purpose of a drainage-tube.

I have been questioned as to the necessity—when capping—of restoring the root of the tooth to its original length. In asking this question, it has probably been overlooked that the cap is only required when the apex is diseased and must be removed, and when its presence would set up irritation. The resection of the root shortens the tooth, which is not in itself desirable. The addition of the cap restores the dimensions, and the cavity of the socket is quite filled, favoring immobility of the tooth, and also pressing out any abnormal secretion which might otherwise collect under the shortened root. The filling of the cap with gutta-percha makes it a solid continuation of the tooth. Nature, it has been said, abhors a vacuum, and this holds very good with the economy of the human system. When from any cause a tooth becomes useless, it is generally cast out, and the alveolar process disappears, while the gum returns to a form which more or less resembles the edentulous arch of the child.

It is on the principle of sealing or protecting the end of the root that I expect to prevent absorption (see Fig. 1, *f*). Where there is no open fistula it is necessary to introduce a drainage-tube of gold through the roots (letter *c*). In every case so operated upon I have had the most satisfactory results, the tooth being permitted to settle

into, and remain firm in its socket during the process of reuniting. In Fig. 2 will be noticed an abnormal condition often seen upon the roots of extracted teeth. The treatment ordinarily adopted in such cases would extend over a very uncertain period, perhaps weeks or even months without success. If, however, the disease is controlled, the tough and tenacious cyst upon the root is simply lulled into a passive state, which, upon the slightest provocation by exposure, may manifest itself again in a still more aggravated form. Other instances have come under my notice where faithful and persistent treatment has *utterly* failed to give relief, the disease having passed into a stage in which the pain was only temporarily reduced in violence by holding iced water in the mouth; the retarded vascular action, of course, being each time followed by a more intensified condition of suffering from a still greater determination of blood to the parts, caused by shock of thermal changes. Again, we have seemingly incurable cases of neuralgia, the diagnostic symptoms being entirely lost. These cases are confusing to both physician and dentist, as the causes appear to be neither constitutional nor local; the physician's prescriptions being powerless to mitigate, while the topical applications of the dentist are quite as futile. A case of this description came under my care some months since, the cause of which I believed to be attributable wholly to exostosis of the root. These different conditions of disease are practical illustrations of the difficulties to be contended with in daily professional life, and have a direct bearing upon our subject this evening.

I shall now engage your attention with a few interesting cases that have been under treatment by the method of tubing and capping. My first case was that of a young lady who consulted me in regard to the treatment of an inferior left molar. Remembering my previous ineffectual efforts in replanting, yet believing the tooth to be beyond the power of treatment in the mouth, I concluded to try the experiment of tubing through the roots; this was done, and the tooth returned to its socket with ultimate good results.

The second was a case of a young man, of nervo-sanguine temperament, and apparently in good health. I was consulted in regard to a first inferior molar, right side, which I found extremely sensitive to touch, slightly elongated, and a continuous throbbing sensation was experienced at the apex of the root. The tooth had been subject to frequent attacks of this kind, extending over a period of three years, but never in so severe a form as at the time it came under my notice. This seemed to be an unfavorable case for treatment in the mouth, and I decided to remove the tooth, fill, and replant it, which was done without tubing. The patient enjoyed immunity from pain for a period of thirty-six hours, when symptoms of trouble again returned, and he expressed himself as suffering, not only in the face and jaw, but from lancinating pain extending to the temples, and down the neck to the shoulders. During the exacerbations, which were more frequent and violent as the malady advanced, he peti-

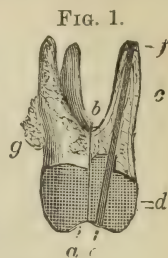


FIG. 1 represents an upper molar, of the palatal root of which a section has been made. *a b* indicates the line of section; which section shows at *c* the nerve canal filled with oxysulphide of zinc; *d*, the gold filling; *e*, the tube, running the whole length of tooth; *f*, the gold cap; *g*, reflected periosteum.

tioned the removal of the tooth; and, as the manifestations were premonitory of a more aggravated form of trouble; it was done.

I now consider that this tooth was lost through my neglect to tube and cap.

The next was a case of a middle-aged gentleman, phlegmatic temperament, who came to me requesting a plate for the lateral incisor (superior), the other teeth being in good condition. On examination I found that the root still existed, although completely covered by the gum, a circumstance the patient himself was not aware of. I proposed the removal of the root, and grafting a porcelain crown upon it, to which he assented. My first step after extracting was to excise the denuded portion at the apex of the root for a distance of about two lines. I then drilled a canal through the center the same size as that in Ash's tube-tooth. Through both root and tube-tooth I passed an adequate gold wire, to the extremity of which was adapted a small gold cap, such as is used in capping the denuded roots of replanted teeth. I then returned the tooth to its socket, and in fourteen days—lost it. For ten days the tooth seemed to be getting firmer, and the gum freer from hyperæmia; it then assumed a threatening form, which increased until I had to remove it.

I am in doubt about this case, as the periosteal membrane seemed in a fairly healthy condition. The tooth, however, might have been ligatured too tightly in its socket, thereby producing death of the membrane from strangulation, all connection with the nutrient vessels being cut off on one side by pressure; or the confined morbid secretions may have set up new inflammation, with results as before named. After improving so rapidly for a time, it became a matter of surprise to me that the tooth was lost; pivoting as I did, it was difficult to tube.

I now call your attention to Fig. 2, representing the condition of a tooth to which were devoted my second efforts in the application of the tube and cap. It was a second superior molar, on the left side, and one that most of you are familiar with, as it was presented before the class during the period of my demonstrations. The pulp had been dead for some five years, and the tooth was a frequent cause of trouble. The apical portion of the palatal root presented very much the appearance of that represented in the figure, and its condition after operating will be better understood by referring to Fig. 1. This case recovered quite as rapidly as any that has come under my care; and when it was shown to the class—something like a week from the time of replanting—it had nicely settled into its socket, and become firmly attached, the gums quite normal, and the tooth free from pain during the process of mastication.

At the same time and in the same mouth was shown the superior left canine, to which was attached an abscess sac at the time of operating. This was treated without tubing and capping some weeks before, and had become so firmly fixed in its socket that no more movement upon pressure could be observed than that to be found in a healthy tooth, the gum being free from any appearance of inflammation.

FIG. 2.



Fig. 2 represents an upper molar with abscess sac upon apex of palatal root. The same tooth, after being operated upon, is illustrated by Fig. 1.

The next case was that of a young lady, who consulted me concerning an inferior left bicuspid, that had been under treatment. Upon examining, I decided that a heroic course of treatment would accomplish the object and effect a cure. My first application was the cause of such distress that I wellnigh lost my patient. She, however, permitted me to continue the treatment, but my most earnest endeavors proved of no avail; and, at last, in a half-soliloquizing manner,—not knowing what else to do,—I suggested the removal of the tooth. This was done, and the same method adopted as in my first case,—tubing and capping. No pain was experienced after the first half-hour of replanting, further than tenderness to pressure. The hyperæmic condition of the gums began to fade away on the third day, and on the tenth the case was dismissed as cured, no distinguishing difference being observable along the gingival border. I have learned that the tooth has occasioned no trouble since, and that it is apparently more firm in its socket than before treatment. This method proving so satisfactory in these two cases, caused me to become more deeply interested in the subject.

The next was a case of an inferior right first molar, which was also exhibited to the class. This had been in a diseased condition only a few months; and it was treated in the manner represented by the vertical section, Fig. 3. A cure was rapidly effected, the tooth becoming firm, and the soft tissues apparently healing, as might be expected of any ordinary flesh wound.

The next case is the most interesting to me of any that I have to relate; which assumed some of the peculiar characters before alluded to, so puzzling to physician and dentist. This was a case of neuralgia of over two years' standing, the pathological condition of which had not been clearly enough defined to enable the patient to obtain relief. Upon examination I found the second inferior bicuspid, on the left side, with an amalgam filling in it, but with no symptomatic phenomena apparent, the gums appearing in a normal condition, and the tooth firm. However, upon interviewing my patient, I discovered that it had been the cause of trouble some time before; but the accessions of the attack not being attributable to any appreciable cause, he had placed himself under medical advice for constitutional treatment. Being suspicious of the tooth, I decided to extract it, when the cause of trouble was explained, there being exostosis of the root. The apical portion of the root was excised, removing the exostosed part, when the same treatment of the tube and cap was adopted as in the previous cases. The tooth was replaced in its socket, and from the hour of its replanting no further pain was experienced from it. I have since received letters stating that he was entirely cured of his neuralgia. There are some here to-night quite familiar with this case, having seen the tooth after its return.

My first demonstration of replanting before the class was on the 27th of June, 1879. This was for a young lady who had been under

FIG. 3.

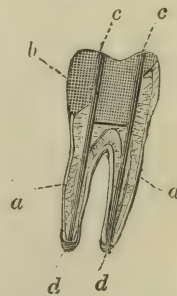


Fig. 3 represents a section of a lower molar. At *a a* will be seen the nerve-canals filled with oxychloride of zinc. At *d d* will be seen the gold caps, while *c c* represent the tubes running from crown of the tooth through the filling to the apices of the roots. *b* shows the gold filling.

treatment at this hospital for acute periostitis in the first inferior right molar. The case not yielding to treatment I removed, filled, and replanted it; this was not tubed or capped. The patient was dismissed in two weeks, free from tenderness and hyperæmia, a condition still existing five months afterwards. In this instance, as I have observed in the majority of cases replanted without drainage, the tooth was not so firm as I should have liked to see it.

The next case before the class was an attempt to tube and cap a right central, and after some time being spent over the case it was decided not to replant, owing to the defective manner in which the cap and tube were made. This case has not been included in the number I have mentioned.

Owing to this failure I appointed a clinic for the class at my house on the 15th of July, 1879, when I operated upon two teeth in the same mouth, one of which, a superior left central, was tubed and capped, the other, an inferior right second molar, replanted without that treatment. According to the last information I obtained they were progressing favorably.

Another case was that of a young lady from one of the provincial towns. I found it to be one of acute periostitis of an inferior left first bicuspid; and no relief could be obtained, except by holding cold water in the mouth. The tooth was extracted, filled without tubing, and returned; up to the tenth day the patient had experienced no pain, further than tenderness upon pressure. This case a month afterwards was quite free from tenderness, but not so firm as those which have been tubed.

I would here remark that it has been my aim to operate upon as many cases as I could in the shortest space of time, regardless of the consideration of a fee, that I might the sooner arrive at some definite conclusion concerning the advantages, if any, of this new method. In a number of mouths two, and in one mouth three teeth have been replanted, treating both with and without tubing in the same mouth, all of which are being worn with comfort. My belief, from observations and experiments, is, that without a system of drainage replantation can never become popular, owing to the fact, that unless the tooth is permitted to remain *fixed* in position, and the attachments are formed in the first stages, firmness may never be expected, owing probably to the chronic hypertrophied condition of the periosteal membrane.

I have here recorded a few cases which have been treated without tubing, and also with tubing and capping. From careful observation of results obtained by both methods, I feel convinced that success will be more certainly obtained by capping and tubing than by any other mode of treatment yet advanced, where replantation is practiced. Yet there are instances, and I have herein mentioned one such case of a canine, in which teeth may be replanted and soon become firmly fixed without any drainage. Nevertheless, these are exceptional cases, and it would appear that their well-doing depended upon a complete absorption of the secreted substances, thereby removing the baneful condition of retained effusion, which retards the healing process and leads to thickening and imperfect reunion of periosteum, consequently to mobility of tooth.

Having entered into a consideration of the complications that may

arise, constitutional or local; also having directed attention to certain conditions of disease, where antiphlogistic measures fail to suppress morbid secretions, when treatment is given in the mouth, I shall endeavor to explain the method of tubing and capping. Fig. 3 shows a vertical section of the lower molar, with the tubes and caps in position, extending through the roots of the tooth and filling. If a cyst is found upon the end of one root only, as in Fig. 2, that alone will require tubing; but if both roots are diseased, it will be necessary to tube both. After the removal of the tooth it should be dropped into warm carbolized water, afterwards carefully wrapped in bibulous paper, saturated in this same solution; it should next be placed in splints of soft wood, shaped in such a manner that when fixed in the vise, and the jaws are firmly closed (see Fig. 4), a generally diffused or even pressure may be obtained over the whole surface of the tooth, and the membrane of the root protected against accident.

The roots should then be cleansed of all extraneous matter, and filled with oxychloride of zinc, after which the tooth may be removed from the vise, and where denudation has taken place, the root may be excised. Then, with a flexible drill, the canal should be formed as nearly as possible through the center, following more or less the direction of the nerve-canal. The tube is then to be introduced into the canal, and the cap carefully adjusted to the apex, so that no projecting surface be perceptible; otherwise there will ensue irritation of the periosteum of the socket, and consequent inflammation, leading to ejection of the tooth. Other complications of a still more dangerous character may arise from this cause of neglect, as trismus.

Previous to this, however, it is necessary to prepare the cavity of the crown for the reception of the gold filling, but this is now too well understood by you for me to enter into any particulars; nevertheless, I deem it advisable to mention that great care should be taken not to obstruct the tube while building around it. The orifice at the crown should be somewhat funnel-shaped (see Fig. 5, A), the reason of which will be seen at the time of plugging. Care must be observed in regard to the perfect articulation of the tooth when replaced, to avoid all undue manipulation upon it after its return to the mouth.

I shall next refer to the gold pin (Fig. 5, B) which is carefully adapted to the tube, in size and length. This is to be used only when a pronounced cure has been effected, to hermetically seal all communication with the socket, thus preventing the entrance of all foreign matters, thereby diminishing the danger of secondary affections. The tooth having been prepared according to the foregoing

FIG. 4.

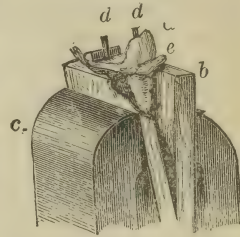


Fig. 4 shows, c, the vise holding the tooth, a, by means of the wooden clamps b. At d d may be seen the tubes running through the tooth and in position; e represents the bibulous-paper wrapping.

FIG. 5.



Fig. 5. A represents the tube, c indicating the funnel-like enlargement at one end, while c shows the cap at the other end, one-quarter of which is in section. B represents the pin for closing the tube when the tooth has become once more in a healthy condition. The extremity, b, being somewhat larger, and made to fit into the funnel-shaped opening of the tube c. This illustration is twice the actual size.

instructions, should be gently introduced into the socket, a small plug of cotton being loosely placed into the orifice of the tube, so that secretions may pass out, and at the same time foreign substances may be prevented from pressing down into the tooth beyond the cotton. The tube should be kept cleansed by a daily changing of the cotton, the cotton to be supplanted later by the gold pin when the parts have become healthy and united. Small pads of cotton soaked in a solution of chlorate of potash may be applied to the gums to allay inflammation. Should there be any tendency to expulsion after insertion,—as is sometimes the case with incisor and bicuspid teeth,—it will be necessary to use a splint or ligature to keep the tooth in place. In this position the tooth is to remain a period of from five to seven days, when, if it has become self-sustaining, the splints may be removed, and in a week or ten days later, under ordinarily favorable circumstances, a perfect union should be established.

During the first four or five days, such food as might cause dislocation of the tooth should be avoided, also needless exposures to changeable temperature. I deem it advisable to have the patient use a mouth-wash, consisting of a weak solution of the permanganate of potash, as this not only cleanses, but its disinfectant properties prevent decomposition.

I shall now call your attention to the manner in which the caps are struck up, and by reference to Fig. 6 may be seen the die, with different sized and shaped indentations, also punches of the several sizes required to fit them.

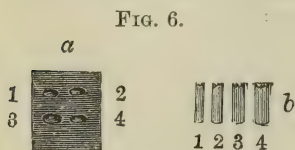


Fig. 6 illustrates the steel die plate *a*, and the punches *b*, used for striking up the gold caps.

The tubes are formed in a manner analogous to wire-drawing; the external diameter being about .75 mm., and the internal diameter about .5 mm.

From the differences in the diameter of the roots, arising not only from different sizes and forms peculiar to themselves, but also varying according to the distance from the apex at which the root is resected, the caps require to be of various shapes and dimensions.

The steel punches (marked 1 to 4 in the cut) corresponding in size to the indentations in the steel die plate, enable me to approximate with considerable facility the dimensions and form of the section of the root which I may desire to cap.

When the cap is adjusted to the root, it will be found, in the majority of cases, necessary to fasten it to the tube at an angle; to obtain this angle, and at the same time to fit the apex of the root, the opening for the tube will not be in the center of the convexity of the cap, but at some point more or less distant therefrom. Having ascertained the position of the aperture, a hole is drilled, and the tube passed through the cap, when it is soldered on the convex side; after which the projecting part is cut off, and the surface of the cap carefully burnished.

During the building of the gold, the pin should be temporarily placed in the tube, to prevent obstruction by pressure; but afterwards removed. When the filling is completed, the entrance of the

tube is slightly enlarged, so as to present the form seen in Fig. 5, B, the pin being made with a long conical head to fit the same. Before replanting the tooth care must be taken to fit the pin perfectly, both as to its head filling the tube and as to its length; so that when it is ultimately placed it may not project in any degree beyond the cap, and at the same time not be so short as to leave any part of the tube unfilled. It has been my aim to enter fully into the very interesting considerations which this subject involves, with a view of directing the attention of others to it.

Drainage after replanting has, for a long time, been attempted; but all the different methods have presented to some extent objectionable features, whether in the establishment of a fistula by an aperture through the alveolar process, or by cutting a groove in the side of the tooth. As our efforts are to preserve as much of the periosteum as possible, the last-mentioned method seems the more impracticable of the two. Notwithstanding this, a considerable percentage of the operations in replanting have apparently been successful.

By tubing, the abnormal secretions are removed from the point where they are most likely to be formed, without coming in contact with any of the living tissues, as they are conducted by the golden and unalterable canal to a boundary beyond their influence for harm, permitting—when health has again been established—closure of the tube. In the upper teeth the force of gravity causes the secretions to descend, while in the lower a different condition, as connected with the tube, exists; however, the secretions, when limited to the quantity contained in so small a compartment as the tube, are not appreciable to an extent that causes inflammation, and the result is—when the discharge has ceased to carry them beyond the external orifice—absorption. In regard to teeth which I have replanted in conjunction with drainage by tubing, the periosteum has seemed to attach itself with greater rapidity and firmness to the surrounding tissues. In fact, I find that when the products of inflammation are effectually removed inflammation soon ceases.

In conclusion, I have but to say that in every instance where I have followed this course of treatment the cases have progressed in a manner highly favorable to my hopes. I have admitted failures, but up to the present time no failure has occurred where I have tubed and capped. Without claiming anything as yet for the practice of replanting teeth, I must say that the action of this system of drainage from the first has been that which I wished for and anticipated, but what may be its popularity, or the benefits it may confer, must remain a question of the future.—*Lecture by W. Finley Thompson, M.D., D.D.S., at the National Dental Hospital, London; reprinted, with alterations by the author, from the Monthly Review of Dental Surgery.*

DIFFICULT DENTITION.—The subject of the following paper was presented to me by my having the care of a case which, while in its main features not unusual, presented certain points of interest, one of which, I think, has not been much discussed, and another, though a matter on which every one has an opinion, depends for its understanding upon certain physiological facts, which I have not seen grouped together.

A boy of one year, having two teeth, and never having fully recovered his strength since being sick with cholera infantum, six months before, had been ill for some days. His diet was a thick mixture of Ridge's food and water, with an equal amount of milk. He had diarrhœa, meal and cheese being mixed with the fæces, vomiting, and cough, for which examination of the chest gave no explanation. Milk and water, equal parts, were ordered, with the addition of an alkali. Ridge's food was omitted.

Second day. No vomiting after the second meal, and diarrhœa ceased. Tympanitic abdomen and much rigidity of legs. Fingers in mouth and swollen gum over the middle superior incisors. I cut the gum.

Third to eighth day. Skin of extremities red, shining, swollen, and tender, but without fever. These appearances ended in a sharp line towards the trunk, advanced over the whole surface, faded without desquamation, and completed their course in three days. Once only, a little cheese in the dejections. Appetite improved, and in eight days he was well, but the teeth had not appeared.

Thirteen days later I learned that directions had been followed for two days only, during which time he was well; then the proportion of milk had been increased, and cheese had appeared in the fæces. In consequence the alkali had been abandoned and Ridge's food substituted. Matters not improving, milk had been repeatedly reduced, so that for two days the diet had been merely Ridge's food and water. During these days the dejections had been mostly meal, the child had been crying, and the fingers had become rigid. The same diet was ordered as before. He stopped crying on getting it, and had a comfortable night.

The next morning the gums were rather swollen, nowhere much so, and he was cross and restless. At midnight he began breathing with a grunt, and early in the following morning the head was hot, fontanelle throbbing violently, pupils contracted and not reacting, lips livid, jaws set tight, and abdomen tympanitic; the gums were swollen, especially at the site of the old cut. He having been in a warm bath without effect, I again cut in the same place, but owing to the contraction of the jaw, or my own clumsiness, without hitting the tooth. There was more bleeding than usual. During the next fifteen minutes the child got his first sleep in twenty-four hours, and the fontanelle ceased throbbing. On waking at the end of that time, he received an injection, evacuating wind and a little fæces of good appearance. About noon, Dr. C. P. Putnam saw him with me, and made some incisions crossing mine. The pupils were then reacting much better than in the morning, but there were fever and râles in the chest. 6.30 P.M. Had taken food, and had a green dejection. Temperature higher; gums more generally swollen and red, and had bled repeatedly. I cut over four teeth of the lower jaw, and he was bathed and oiled. Three hours later, the temperature still rising, I cut two more teeth, thus completing the incisions wherever the swelling was marked, and he was again bathed. Rigidity continued, and an hour after midnight he died.

An autopsy was made fifty-seven hours after death, Dr. Draper being present. The fontanelle was much sunken. The brain was very much injected; not much serum in the ventricles. No patho-

logical changes. Kidneys and liver normal. Lungs engorged in lower lobes, but crepitating. Calvaria cartilaginous. Heart, bladder, and intestines not examined.

Although the case is, excepting for the continued bleeding, by no means uncommon, it illustrates certain points in the treatment of children, notably gum-cutting, the use of starch, and the difference in physiological age. Twice during my attendance the gums were cut. On the first occasion there seems to have been no effect, the improvement being remote, and after much trouble. On the second, the effect, though only temporary, seemed for the moment to be brilliant, the more or less comatose condition of several hours disappearing at once in sleep, the violent throbbing of the fontanelle diminishing from the first, and the pupils, which were greatly contracted and altogether irresponsive to light, being, when next examined, much better in both respects. It remains to be proved that the relief was consequent upon the incisions, but the connection was certainly interesting. That this one cut was not the only thing wanting is shown by the death, which may or may not have been owing, in part, to the delay in completing the incisions. It should be stated, however, that the swelling of the seat of the later incisions was but slight until late in the day.

I have cut into swollen gums on twenty-one different occasions. Of course, this number is altogether too small to be regarded as affording anything more than a slight contribution to the study of the subject, and yet the study of these cases may not be without interest. Of them, one may, I think, be fairly subtracted, because the indications for it were not very marked, and the failure of what had been done as giving a bare chance of relief ought not to be compared with cases in which there was positive expectation of it.

Of the remaining twenty occasions, in one, the first incision in the reported case, the cut entirely failed. In one, the group of cuts on the last day of this patient's life, the incisions, at first promising well, finally utterly failed. The remaining eighteen were all followed rather closely by a certain amount of improvement.

In a few of these cases I have delayed cutting, hoping to reach the desired end by regulating diet, and this may somewhat alter the value of the statistics. It is, however, my impression that in those cases in which I have not been allowed to use the gum lancet improvement has been less rapid. In another group of these eighteen cases, gum-cutting has constituted the whole treatment, and in three at least of these last, the fretful child of the previous twenty-four hours has recovered its temper and spirits within an hour, and has had an improved appetite for its next meal, or the next but one.

Two cases seem worthy of especial mention. One, a little girl, still walking and speaking with difficulty, apparently remembering the relief given on a similar occasion with another tooth, asked me to cut her gum. That this was a request, and not an exclamation, was made clear by her coming towards me as she spoke. The other, whose gum I had cut at fourteen months, during the absence of his physician who had afterwards repeated the cut, came to his father, when suffering from a later tooth, with a knife from the dinner-table, and a request for the operation. These two cases I allude to because in them the relief to suffering must have been considerable and immediate.

The case we have been considering has for its one unusual, not unique feature, bleeding from the gum, and the cause of this bleeding seems worth investigating. There was an unusually great, but by no means very great, loss of blood at once, and during the afternoon the cut repeatedly oozed, though in the opinion of the nurse to no great extent. This had the effect, when I decided in the early evening to extend the cuts, to make me do it half at a time, in order that I might not have too great a bleeding surface to do with in case of accident, there being still two molar teeth over which I then thought the gum needed cutting, which was done a few hours later. Now the one positive thing shown by the autopsy was that the brain was overcharged with blood, and it has since suggested itself to me that anything that would have helped to restore the natural condition of things there, and anything that would have diminished the uneasiness in the gum, and so lessened the grinding, would have lessened the probability of bleeding; that is, that there would have been less chance of bleeding had the incisions been finished at once. I offer this as a possible explanation of this case of bleeding, not of all cases, and to ask for criticism.

Then the question of the diet of this child is an interesting one. I hope we shall learn from some one present if teething never causes disturbance in nervous children who are properly fed and cared for. But it is certain that ill-fed children have the reputation of suffering most. Still we hear of so many children who eat all sorts of things and are well, that the question of starch digestion is interesting, and especially so in view of the fact that many children get it in small quantities as an adjunct to milk, and are reported as thriving. In consequence, I have searched for reports of experiments bearing on the subject.

Although the saliva, even of very young children, has been reported to have the power of turning starch into sugar, yet the food must be in contact with it but a very short time before passing into the stomach, and in the stomach of adults at least its diastatic action seems to be hindered.*

Prospero Sonsino,† of Florence, found that the fresh infusion of the pancreas of five young sucklings, dogs, rabbits, and a cat, had no diastatic action upon starch even after a long time, while the similar infusion made from adults transformed it almost immediately. He made similar experiments on the enteric juice, though with less satisfactory results, but some of them appeared to show him that the intestine transformed starch at an earlier age than the pancreas. Sonsino himself raises the question how far we may reason here from analogy.

Korowin,‡ at the children's clinic at St. Petersburg, made examinations that, in connection with those of Sonsino, appear to be of more value than either alone, inasmuch as both reached somewhat the same result, the one through children who had died sick, the other through animals which had died well. Korowin tried to turn starch into sugar by means of the pancreas of children who had died

* Dalton, pages 113, 114, edition 1867.

† Practitioner, ix. 155.

‡ Centralblatt für die medicinischen Wissenschaften, No. 17, 1873, s. 261.

of different diseases, mostly of the chest and intestines, and who were examined at different periods after death. He found no diastatic action during the first month, a little during the second, enough for quantitative analysis at the end of the third, and the quality fully developed at the end of the first year. His report, which is valuable, would, I think, be more so if he had divided his intestinal and non-intestinal diseases into two groups.

I am indebted to the note-book of Dr. G. M. Garland for an account of examinations by Dr. Hans Wegschneider, who succeeded in converting starch into sugar by means of the fresh fæces of sucklings. He sometimes got a reaction in an hour, a strong one in twenty-four hours. These experiments agree with those of Sonsino on the infant intestine. The value, however, of Sonsino's experiments on the intestine is diminished by the observation of Paschutin,* that the mucous membrane of other organs in dogs has diastatic power.

Besides these experiments in cooking starch in secretions and in infusions of organs, there remain those made directly upon the intestinal contents of young starch-fed children. In twelve autopsies, made by M. Guillot, of children dead from different diseases, he found that both the small and the large intestine contained starch, as shown by a deep blue with tincture of iodine. I believe that there is a fuller account of these autopsies than I have been able to find, but that the children were quite young appears probable from their being quoted by Valleix† in an article based on observations on the newly born. Zweifel‡ examined the body of a seven days' child, born at term, and fed exclusively on Nestle's *kindermehl*. The contents of the stomach were slimy and swollen, containing sugar and especially starch, which through its swelling had pressed the stomach out of place. The large intestine contained only unaltered starch. It would seem from this report that the child must have been liberally supplied with it, but it is to be observed that the remaining parts of the diet were disposed of. One analysis§ of the *kindermehl* shows sugar, fat, salts, etc., and thirty per cent. starch and dextrine. Other analyses give little starch.

Of course, in any experiments made at an autopsy, we are dealing with the organs of the sick, and it is always a fair question how much the sickness has altered the conditions. While we may have to wait a long time for the combination of a group of early autopsies in starch-fed babies, dead from violence, yet meanwhile we can examine the fæces of living children.

Prospero Sonsino made ten such examinations, as follows: || (1) Sick child of three months. Nestle's *kindermehl*. Starch shown in fæces by iodine and microscope. (2) Enlargement of glands of neck, atrophy and diarrhœa at six months. Diet lactose. No starch in fæces. (3) Well except for club-foot. Three months. Lactose. Strong blue color with iodine. (4) Condition not stated. Fifteen

* Centralblatt für die medicinischen Wissenschaften, 1870, s. 560, 577.

† Cliniques des Maladies des Enfants nouveaux nés, page 491, Paris, 1838.

‡ Klinik der pädiatrik Studien und Vorlesungen, L. Fleischman, Vienna, 1875, s. 141.

§ Klinik der pädiatrik Studien und Vorlesungen, L. Fleischman, Vienna, 1875, s. 142.

|| Practitioner, x. 11.

months. Beef-tea and lactose. No starch in fæces. (5) Convalescent from pneumonia. Five years. Starchy food. A trace of starch in fæces. (6) Empyema and rickets. Three years. Milk and starch. Fæces afford strong evidence of starch. (7) Condition not stated. Three months. Mother's milk and bread. Fæces contain starch. (8) Condition not stated. Twelve months. Milk and flour. No starch in fæces. (9) Condition not stated. Age four and one-half months. Groats, corn flour, and milk. Starch abundant in fæces. (10) Condition not stated. Ten months. Beef-tea, yolk of egg, milk, and twice a day one teaspoon of arrowroot. Fæces contain a little starch.

It is interesting to notice that the pneumonia-convalescent and the patient with empyema and rickets did not digest all their starch, though far beyond the age at which Korowin's examinations would lead us to expect that they would; also that the ten-months' child, health unknown, failed to dispose of two teaspoons of arrowroot, half at a time, and to observe that he was taking not merely arrowroot, but a mixture of four different articles.

The most valuable cases of the series, as bearing on digestion under ordinary circumstances, are the five-months' boy, well but for club-foot, who passed unaltered starch, and the three children of twelve to sixteen months, of whom one at least was ill, who digested it.

During the past two weeks I have tried to repeat these experiments, but being unwilling to be the means of making young children eat starch, and not caring to experiment except with well children, have but one case to report. This is a perfectly healthy boy of eleven months, having five teeth, and eating Indian and oat meal, bread, cracker, and milk. I have repeatedly examined his fæces with iodine, always with a negative result.

It seems to me that in examining fæces for this purpose, either sick children should be rigorously rejected, or at least they should be arranged in a separate group. Such statistics, though less numerous, would be more valuable. It seems to be shown by this group of experiments that while there may be some question as to what is the earliest age at which starch is digested, it certainly is, in some children, in very small amount before the third month, and that as a rule children cannot digest it before the second year, perhaps later, to the same extent that adults can. These results seem to be reached most definitely by the experiments of Korowin. We may get still more definite ideas with increased knowledge of the infant intestine. The examination of recent infant fæces seems also a promising field of inquiry. But we can never arrive at exact results owing to what has been called "the difference of physiological age" in children at the same period after birth,—a difference perfectly well recognized. Compare, for instance, the case with which this paper was begun; a year-old child, with two teeth, who passed Ridge's food unaltered through the bowel, with the other boy of eleven months, who had five teeth, and whose fæces gave no reaction with iodine, in spite of bread, cracker, and meal. It is well known that many physicians are in the habit of ordering starch in small quantity with milk, and getting good results, and it has been shown by Dr. Putnam* that

* Boston Medical and Surgical Journal, August 1, 1873, page 81.

starch so given may make milk more digestible without being itself digested. It seems to be desirable, where this practice is followed, to have it thoroughly understood by the attendants that they are dealing, not with a food, but a drug, and a powerful drug, in order to hinder such abuse from ignorance as in the reported case in which starch was not recommended at all.—*Edward M. Buckingham, M.D., before the Boston Society for Medical Observation—Boston Medical and Surgical Journal.*

ERRORS OF CONFORMATION OF THE NASAL CHAMBERS STUDIED IN RELATION TO THE CAUSE OF NASAL DISEASE AND IRREGULARITIES OF THE TEETH.—Dr. Harrison Allen traced the plan of the normal facial development, and contrasted it with the results of departure therefrom. After a description of harelip, cleft palate, etc., he spoke of a class of errors which in his judgment deserved more attention than they had hitherto received.

Instances of congenital fistulæ of the neck,—of depressions or clefts in or about the auricles,—of dermoid cysts of the face and neck,—were thought to be traceable to imperfect closure of the spaces between the visceral arches of the embryo. He thought that this subject had been much neglected in this country, so far as he knew no cases having been recorded here. In Europe, Ascherson, as early as 1832, had collected eleven instances of cervical fistulæ; Paget has lately elaborately studied the defect of the auricle; Murray and Richet have given us instances of cysts of lower lip; and Cusset and Wagstaffe have determined the locations of dermoid cysts, the latter having tabulated twenty-three examples of this interesting excess of growth, the result, it was thought, of imperfect nutrition at certain points along the lines of the visceral arches. The immediate object of Dr. Allen's communication, however, was to ask of the members assistance in collecting materials for another object of study. The speaker had been for the last four years engaged in collecting cases of errors in development and growth-force of the face, processes not ending in gross defect, but exerting just sufficient disturbing influence over the bones of the face to prevent perfect success in shaping the nasal and oral cavities. As a tentative hypothesis to aid him in his researches he presented the following: That inasmuch as the face is a result of the lateral visceral half-arches joining the median structures projected from the front of the brain-case, it follows that if there is want of harmony between the two genetic movements, errors of symmetry may readily occur. Explanation may be thus given of the asymmetry of the nasal chambers, the external nose, the two halves of either of the dental arches, entirely apart from the acquired defects in the same localities.

Applying this hypothesis to practice, Dr. Allen had recognized a well-defined group of cases in which the nasal chambers remained from birth partially or entirely occluded. He mentioned in detail two cases in which breathing through the mouth was enforced, and the permanent teeth came in irregularly. He thought that the permanent teeth always had a tendency to irregularity when marked obstruction existed in the nasal chambers at the time the permanent teeth are developing and erupting. This is due to two causes, viz., the absence of the normal occlusion with the teeth of the lower set

in mouth-breathers, and the errors of developmental force which have operated in preventing the proper formation of the nasal chambers and the superior maxillæ. He thought that in cases of obstinate nasal catarrh in children from seven to eighteen years of age, in whom the upper permanent incisors were overlapping and convergent, the two halves of the upper dental arch more or less V-shaped, the tonsils tumid, the roof of the mouth with a high, narrow vault, the cause was deep-lying and congenital, and affected all the structures of the face. Those adults who have measurably recovered from the nasal trouble named, owing to the compensatory changes in the bones, may yet have irregular upper teeth and a high-pitched hard palate. In addition to these peculiarities they exhibit a peculiar form of the external nose. The organ is unusually prominent, and possesses a stout septal cartilage. Dr. Allen believed that this peculiar shape of the nose was the result of a persistent narrow hard palate. Such a palate did not permit the nasal septum to grow downward, and, as it could not extend backward, by reason of the peculiar fixation of the vomer, to the sphenoid bone, it was forced to go forward: hence the projecting nose. It will be thus seen that we have for one form at least of nasal catarrh in the adolescent, and one form at least of irregularity of the teeth, a simple cause, which necessitates, however, a knowledge of embryology to understand. Dr. Allen desired access to more material for study than he was likely to secure unaided, and requested the members to furnish him with any information which would either confirm him in his position or correct his temporary conclusions.—*Proceedings College of Physicians, in Philadelphia Medical Times.*

EFFECTS OF LOCAL IRRITATION ON PAIN.—At the meeting of the Académie de Médecine on the 4th instant (*Bulletin*, No. 44), Dr. Dumontpallier read a memoir on "Local Therapeutical Analgesia induced by the Irritation of the Similar Region on the Opposite Side of the Body."

"From this communication it results that pain seated at one point of the body yields to an injection of simple water (which, as is known, produces local irritation) at a small point on the opposite side. In neuralgias of different seat and nature, in acute articular rheumatism, and in rheumatic or toxical neuralgia, I have requested patients to mark with the finger the painful points, and that being done, I have sought out similar points on the opposite side of the body, and at these latter points, for the most part not painful, I have practiced injections of water or simple punctures. As soon as irritation has been produced on the sound side, the patients have acknowledged a diminution, and often a complete cessation, of the pain on the bad side, and that, I repeat, in cases of acute rheumatic arthritis. I have chosen this last example as a demonstration, as one could scarcely in such a case be deceived by patients. The joint may be red, swollen, hot, and painful to the touch or the slightest movement, but immediately that the little operation is terminated, the patients find that the pain diminishes or disappears, and that they can perform flexion or extension of the joint,—the swelling preventing much motion, but the pain is gone."

The following are the conclusions arrived at: "1. Every subcu-

taneous medicinal injection is a complex operation, in which a part must be assigned to the medicinal substance, and a part to the irritation produced. 2. The local irritation is transmitted from the periphery to the sensitive centers, and there determines a modification, the consequence of which is a diminution or cessation of the peripheric pain. 3. The real, anatomical seat of certain peripheric pains should then be in the sensitive centers,—an assertion which seems demonstrated by the crossed action of induced peripheric irritation. 4. Irritation induced *loco dolenti*, or in the vicinity of the painful point, assuages or causes the cessation of pain; and when the irritation is induced at symmetrical points on the opposite side of the body, it proves often sufficient to cause a complete and durable cessation of pain.”—*Medical Times and Gazette*.

ON THE SENSIBILITY OF DENTINE.—The president called the attention of the society to some physiological questions relating to the sensibility of dentine, and illustrated his remarks by diagrams. The points enforced were that the dentine is to a great extent endowed with sensibility by its connection with the nerves of the pulp, but not wholly so, for areas of exposed dentine are sometimes found acutely painful, when touched by steel instruments, in which the tooth-pulp has entirely perished. In such cases the connection of the sensitive dentine with the sensorium must be through the nerves of the periosteum, and he believed that such a nervous connection always exists. Furthermore, in some instances in which there was sensitive dentine, and the pulp still remained quick and alive, the usually received explanation—that the nervous connection was established by a direct radiation along the tubes from the pulp to the sensitive area of dentine—could not hold good, as the intervening dentine might be, and often is, eroded by decay, and yet an outlying mass of dentine remains painful to the touch. In such instances, if the pulp is the source of sensation, it must be established by a circuitous route and by collateral connections. The president then read extracts from a letter he had received from Mr. Alfred Coleman, in which he stated that he had met with cases of sensitive dentine that could only be explained by the views already propounded.—*Association of Surgeons practicing Dental Surgery, in British Journal of Dental Science*.

HINTS AND QUERIES.

“He that questioneth much shall learn much.”—BACON.

CORRESPONDENTS desiring a reply in this department are requested to make use of *distinctive signatures or initials*, and avoid the practice of signing their communications Reader, Subscriber, etc.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names. We cannot insert queries or replies except they are so accompanied. Names not necessarily for publication.

A LEFT, upper, second bicuspid was largely decayed on the anterior approximal surface, the cavity extending from the gum to and embracing part of the grinding-surface,—a compound cavity. Although the tooth was deeply decayed, the pulp was not exposed, and in preparing the cavity but little pain was caused; there was some sensitiveness, but it was not at all severe. After being prepared,

it was well plugged with cotton till next day; when, on applying the rubber dam and attempting to dry out the cavity, it was found that the slightest touch of the softest substance gave exquisite pain. A few fibers of silky spunk, a pellet of crushed bibulous paper, a small globe of cotton,—either of these simply *laid in the cavity, without pressure*, was unendurable to the patient, and a good patient, too. Careful scrutiny found no nerve-exposure. An application of carbolic acid sent thrills of pain to the very brain. Here was a dilemma. Should the permanent operation be postponed; should a temporary filling be inserted? Ordinarily, yes. Upon consideration, it was determined to proceed with the permanent filling. In a few minutes after commencing to pack the gold the pain subsided, the operation was completed after two hours' work, and everything was serene. Who can explain this phenomenal sensitiveness,—its presence, its disappearance?—**QUERIST.**

I HAVE a little patient, about ten years old, with the palatal portion of the left superior central incisor presenting labially. I am very anxious to turn this tooth into its proper position. I find I will have plenty of room on the left side to work. While very young this patient was operated on for "harelip," and I find on the left side a small space and a deficiency of bone between the central and the lateral incisor (which is a temporary tooth). The right central incisor is in proper position; the left central (the one I must turn) is only one-quarter inch through the gum. Would it be wise for me to move it, or had I better wait until the tooth is fully erupted? Will some reader of the **DENTAL COSMOS** be kind enough to give me advice as to the best method of treatment?—**O. T. Mc.**

In my experience, the breaking away of devitalized teeth from around large annealed and welded gold fillings is of frequent occurrence within three or four years subsequent to their insertion. To what extent is this breaking or splitting caused by the expansion of the solidified gold under the influence of thermal changes in the mouth? As it often happens when the tooth involved has no antagonist, it cannot always be due to the forces employed in mastication.—**AN INQUIRER.**

WILL some one describe a method of inserting pivot teeth that will meet the following difficulty? When a *plate* tooth is selected for pivoting, and the backing has been put on, and the pivot (either of gold or platinum wire) is soldered to the tooth, *how shall it be made firm in the root?* If fastened in with gutta-percha, how is it done? If cemented in with oxychloride, how? Will some one throw light upon this particular point?—**QUESTIONER.**

PREPARATIONS of conium, or of its alkaloid, conia, are, it is said, much used in Europe for the treatment of exposed and aching tooth-pulps. Will any dental practitioner who has had experience in its use give to the profession an account of his manner of using the drug, and of its therapeutic powers in pathological conditions of tooth-structure?—**F. W. C.**

WILL manufacturers of gold foil state the process of making it cohesive? We are told by them that it is attributable to the purity of the gold. That is hardly satisfactory when we buy of them gold foil having different degrees of cohesion, all of which is claimed by them to be "1000 pure."—**Z. I. G.**

I HAVE had some trouble in one case from wearing rubber plates, resulting in what is commonly called rubber-poisoning. We know that certain constitutions are more susceptible than others to various poisons; but what must be the condition of the fluids of the mouth in order to cause the rubber-poisoning?—**J. D. U.**

WILL some one give the readers of the DENTAL COSMOS his most successful method of capping exposed pulp, and his reason for adopting such practice to the exclusion of others?—J.

WILL some one who is successfully using the electric mallet give his manner of adjusting and operating it, and the best way to manage the battery, to help one who has not succeeded with the instrument?—GRADUATE.

WOULD a filling which prevents ingress of moisture to the cavity, but which absorbs moisture, be considered by the advocates of the "New Departure" a leaky filling?—Z.

I HAVE had great difficulty in keeping rubber out of the joints in vulcanite work. Is there any perfectly certain method of accomplishing this?—D. D. S.

WILL some one, through the DENTAL COSMOS, favor me with some practical hints relative to the manufacture of continuous-gum work?—S. T. B.

ANSWER TO A. B. C.—I should advise him to get an accurate impression with *plaster*, and then use soft rubber along the edges of plate (on the inside only). The soft rubber will stay soft as long as it lasts.—J. D. U.

CASE FROM PRACTICE—PAPILLOMATOUS TUMOR.—The following case having a history which associates it with what is to be esteemed an improper dental practice, is offered as a contribution to oral surgery:

Mrs. B., a lady of lymphatic temperament, sixty-four years of age, markedly anæmic, presented herself for consultation concerning a tumor occupying a central position upon the palatal arch.

Examination exhibited a tough, movable mass, three-fourths of an inch in length by half an inch in breadth, entirely painless, lobulated, pedunculated, and covered by mucous membrane having borders more or less serrated. The jaws of the patient were edentulous. A vulcanite plate had been worn which depended for its fixedness on a deeply-indented suction-cavity. The age of the growth was two years.

The position of the tumor pointed to irritation arising out of the presence of the cavity in the denture, conveying an impression that had there been no suction-cavity there would have been no growth. The toughness, painlessness, and mobility indicated benignity.

What was this tumor, histologically considered? There was no fungoid proliferation. It was not a node. It was not a simple hypertrophy of a submucous gland. It was not a disease of constitutional expression.

By exclusion, a means of diagnosis that oral surgery greatly relies upon, the tumor identified itself as a dendritic growth, a papilloma. The papillomata, according to that able histologist, Virchow, are primarily to be accepted as hyperplasiæ originating in irritation arising out of contiguous depots of offense. Later, a probability exists of a transforming degeneration of them into villous cancer. Dendritic growths choose as a favorite location the mucous surfaces. They offer a distinguishing characteristic, as relation is held with ordinary tuberos and polypoid elevations conditioned by hypertrophy of glandular structure.

What is known as "the wart" is frequently met with about the mouth; common seats being the gums and inside surfaces of the cheeks. Warts are growths allied with the condylomata; recognizable from the latter, however, by the greater epithelial compaction of surface.

What is to be done with a growth diagnosed as papilloma?

The tumor under consideration having its origin in irritation arising out of an ill-constructed denture, the primary indication exists in such direction. This indi-

cation has a secondary but not less important signification in a hint afforded dental practitioners, that dentures depending for retention on special cavities rather than upon general adaptation are associated with danger to the lives of patients; a hint which it is the immediate intention of this paper to emphasize.

The danger of degeneration on the part of the papillomata indicates necessity for removal of all such growths by operation. The means practiced in the present instance was as follows:

The patient being placed at a reclining plane in a Morrison chair so as to secure as perfect a view of the arch as possible, the pedicle of the tumor was strangulated, a strand of waxed floss-silk being used. This accomplished, an assistant was made to grasp the growth with convenient forceps, and while pulling the mass forward, and twisting it upon the base, incisions were carried along either side, thus freeing the attachment. Hemorrhage following the operation was treated by pressure of the finger, aided by free use of tannic acid,—a manner of treatment which, in the opinion of the writer, possesses great advantage over the employment of Monsel's salts of iron. The prescribing of an astringent wash, conjoined with directions as to the wearing of a plate, completed the immediate attention demanded by the case.

Up to the time of penning this communication there is no appearance of any return of the growth; on the contrary, the parts indicate complete cure of the lesion.—JOHN S. SMITH, D.D.S., *Lancaster, Pa.*

EXTRACTING ROOTS.—There are few operations in dentistry more painful to the patient, and, at the same time, more perplexing to the operator than the extraction of roots. After experiencing many annoyances of this kind, I have adopted the following method of procedure in these cases: I first remove the soft parts; then, using a spade-pointed drill, with the engine, I carefully remove that portion of the bone which most closely embraces the root and forms the chief point of resistance; then with a forceps, or often simply with a pair of pliers (which in many cases will be found quite sufficient), I am able to remove the root by the employment of very slight force, and with little or no pain to the patient. When the molar roots are still united, I separate them with the drill, and then treat each root as above indicated. Some will no doubt object to this use of the drill, on the ground that it involves the removal of an unnecessary amount of bone. In reply, let me say that with the elevator, or even the root-forceps, the amount of bone removed may be quite as great or even greater than with the drill,—the fracture often extending much beyond the desired point. On the other hand, the operations of the drill can be very accurately circumscribed. For years past I have been constantly using the engine in my office, but in no case with more satisfaction than as an aid in extracting roots.—L. E. W.

THIRD DENTITION.—Dr. J. B. Galer (practicing physician), aged fifty-eight years, came to my office and had all the teeth (four in number) in the upper jaw removed, and an impression taken for an upper denture. This was six months ago. About four weeks since he came to me, complaining that the plate did not fit as it should. Upon examining his mouth I found a new tooth making its appearance in the site of the central incisor. He requested that it be allowed to remain for a time, and I assented. Subsequently I extracted the tooth and found it to be a fully-developed canine. It was lying almost horizontally in the alveolar ridge; the apex of the root was turned to a complete right angle in the jaw. A portion of the enamel was in a honeycombed condition, while the rest was sound. He told me he had both his canines extracted fifteen or sixteen years ago.—M. H. Ross, *Hampton, Iowa.*

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ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to Act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the office of the Librarian of Congress at Washington.]

(Continued from page 118.)

It is very generally the case that decided alleviation, if not positive relief, is a prompt sequence to the drilling of the vent; when this is markedly so (periodontitis of "first grade") the indication is, to follow with an immediate commencement or continuance (as it may be) of the regular work in hand.

If a *relief* drill-hole only has been made, and that at an inappropriate place for the further treatment of the tooth, it is, by all means, desirable that an entrance be effected at such position as will permit the cleansing of the pulp-cavity and canals by the removal of the remains of the pulp.

If it has fortunately occurred that the relief entrance has been made at an appropriate point for the complete prosecution of the work, it should be enlarged to such capacity as will permit the easy, thorough extirpation of the pulp *débris*.

When upon "extirpating the dental pulp" the various methods of manipulation for the systematic prosecution of this operation, in connection with single-rooted and multi-rooted teeth, were given; but it must be remembered that while the work of entering into and cleansing the canals is practically *the same*, the conditions existing in relation to teeth with recently devitalized pulps and those suffering with peridental irritation due to putrescing pulps are *widely different*.

It was directed in cases of recent devitalization that each canal should be closed with medicated twists of cotton; but such practice is entirely contraindicated in the treatment of periodontitis.

It is proper that *purifying* applications should be made, that in addition to the washing out of the cavity and canals by syringing (I should recommend *tepid* water, *merely for the maintenance of the habit*) such medicaments as glycerin (antiseptic), alcohol (detergent), oil of cloves (soothing, pain-obtundent), tincture of aconite (antiphlogistic, sedative), tincture of calendula (depurative, healing), and the like should be employed.

I cannot too strongly advise *against the use* of creasote, oily carbolic acid, and tincture of iodine in these cases, as I feel thoroughly impressed with the conviction that to the employment of these irritating medicaments is largely due the far too general infliction of suffering and loss of teeth which forms the past "record" of periodontitis.

After a proper cleansing of the interior of the tooth, a drop of glycerin should be taken upon a moderate-sized probe and placed in the pulp-cavity; this should be worked *gently* into the canals with a fine probe; a portion of oil of cloves or of phénol-sodique should then be introduced from a comparatively large blunt probe.

NOTE.—Probes of different sizes (three or four) will be found advantageously adapted to the various medicaments used in treating teeth; the size of the probe should *decrease* in proportion as the medicament *increases in viscosity*,—large probe for tinctures (except the tincture of iodine), watery extracts (hamamelis, etc.), oils (carbolic acid, cloves, etc.), solution of sandarach, alcohol, and other *easy flowing* medicaments; small probe for glycerin (viscid) and for pastes (acetate of morphia, arsenical, etc.); and still smaller and finer probes for working medicaments into the various sized canals.

Having filled the canals and pulp-cavity with the appropriate medicaments, the external orifice should be closed by *very loosely* introducing pellets of cotton moistened with phénol-sodique or oil of cloves (lest the *dry cotton* should draw the medicine from the canals), and these again *may be* touched with solution of sandarach if it is deemed needful for the increased certainty of maintenance of pellets in position.

The stopping should be *as loose as is consistent with possibilities*.

It is now that a sort of interchange begins to take place between the effusions (external) and the medicaments (internal), *via* the apical foramen,—an interchange which permits at once the escape of fluids which, if confined, would soon become irritating, both mechanically and vitally, and the placing in association with inflamed parts of such soothing medicaments as shall tend to assist nature in the restoration of comparative normality.

The patient should be directed to return, if possible, if any *recurrence of pain* supervenes; and if such should occur at a time when a

visit is impracticable, he should be directed to *loosen* or *remove* the cotton stopping and report as promptly as possible.

It is a matter of much moment, especially in cases where from complications such as adverse systemic or temperamental attributes, contiguity of previously irritated teeth, especial value of affected teeth, etc., that the stoppings should be manipulated by the dentist, for with each unstopping, removal of inspissated effusions, replacing of fresh medicaments and concomitant affording of relief, a solid advance is made towards the final cure; whereas, if the cotton is removed by the patient, the fluids of the mouth are afforded ingress and the *open* (pathological) condition of the tooth is re-established. Nevertheless, it is better thus than that the patient should suffer.

With each re-medication and re-stopping a gain in the direction of tightness of closure should be attempted; then the filling of the pulp-cavity with cotton, or even the closing of the large canal (if the tooth be multi-rooted), would be in order until at last all canals into which it is possible to introduce twists of cotton dipped in oil of cloves should be thus dressed. A *temporary stopping* should then be made, and the tooth should be allowed a week or two for thorough recuperation.

NOTE.—Temporary stoppings may be made of red gutta-percha (base plate); of a mixture of paraffin and fine silice; of a mixture of red base plate and oxide of zinc; of a mixture of red base plate and white wax (by melting the wax over a sand-bath and stirring in small pieces of base plate till a desirable consistence is obtained).

While this is the ordinary result of the practice given in cases appertaining to the "first grade" of periodontitis, it is insufficient for cases pertaining to the "second grade" (see DENTAL COSMOS, April, 1878, page 188).

In these cases of "second grade," to which belong more marked soreness of tooth, less prompt appearance of symptoms, and more extended tissue-irritation, it will be found that the "resolution" of the existing inflammation is a work much less easily accomplished, and indeed only effected as the result of "accurate and somewhat persistent" treatment.

It may be that the relief afforded by "venting" will be such as to permit a free ingress to the pulp-cavity at a first sitting, but it will soon be demonstrated, by recurrence of pain from dental manipulation, that any undue indulgence in this direction would not be wise; it will then be recognized that the great point—a *well-opened tooth*—having been attained, it should be permitted to demonstrate its power for good, and that it should be aided by the insuring of that "absolute rest of the parts" which was given as the *second local considera-*

tion upon which the treatment of any inflammation is based (see DENTAL COSMOS, March, 1879, page 122).

As *occlusion* is the direct means of continued irritation, a preventive of this is the first indication to be met.

This is most easily accomplished by making a "guard" of gutta-percha, which is done by taking a piece of red base plate (*selected* for toughness), warming it *carefully* (slowly) over the flame of a spirit-lamp, and rolling it into a ball of about the size of an ordinary marble.

This having been again warmed to a proper (agreeable) temperature, is pressed over the appropriate *lower* teeth, as if for an impression; it should be nicely moulded while upon the teeth, concaved a little upon its lingual face and convexed upon its buccal or labial face, and then carefully removed; the "guard" should then be *gently pressed a little together* and placed in cold water for thorough hardening; the object of this is to insure that accurate fit which will more securely maintain the appliance in position.

The guard should be placed upon the *same side of the mouth* with the affected tooth, for the double reason that while absolute rest is thus afforded the irritated tissues, an equally absolute freedom to indulge in such partial mastication as is possible is attained.

If the affected tooth is in the upper jaw, the guard should be so situated as to strike against an adjoining tooth, at such distance as to be incapable of irritation; but if the affected tooth be on the lower jaw, the guard should be adapted to approximately contiguous teeth at such distance again as to preclude the possibility of irritation.

It is usually sufficient, for all practical purposes, that the articulating surface of the guard remain smooth, as moulded; but it is sometimes the case that a smooth surface makes an awkward and unpleasant occlusion.

When this is so it may be remedied by allowing the patient to close the antagonizing teeth upon the guard while it is somewhat soft; this secures a comfortable "bite."

This form of guard has been given as that which is most quickly made and most easily adapted, and it also possesses the advantage of ready removal and replacement by the patient, thus permitting perfect cleanliness; but there are some temperaments which irresistibly work with and chew at any appliance which it is possible so to treat.

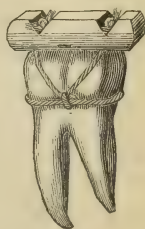
With such patients the guard of gutta-percha is soon loosened in such degree as to be not only annoying but positively irritating, and more than this, is so chewed up as to become utterly useless.

Under these circumstances a piece of silver or gold plate may be cut into the form of an H, when, by bending the cross-piece and curving the two side-pieces, it can be so adapted, to a molar particularly,

as to be very efficient and very secure. When I utilize one of these appliances I always make a couple of holes through the lingual side-piece, and passing a ligature of book-binders' thread through them, tie it around the neck of the tooth.

I regard this extra security as an essential, for the slipping off and swallowing of such a guard might readily be attended with serious consequences.

From the fact of this possibility I prefer a third form of guard, which consists of a piece of hard wood one-eighth of an inch thick, one-quarter or three-eighths of an inch wide, and a half or three-quarters of an inch long, the ends rounded, grooved on the upper surface at each end, and having two holes drilled through it in each groove; a four-tailed ligature (see DENTAL COSMOS, June, 1877, page 285) is then put around the selected tooth and tied upon its buccal face, if the tooth is one of a continuous row, or upon its mesial face if the tooth is a lone tooth; the object of this latter is to avoid, if possible, the placing of a knot in such position as might irritate the tongue.



NOTE.—Knots upon the lingual faces of *lower* teeth, and, indeed, ligatures, rubber tubing, etc., attached to *lower* teeth, are not likely to irritate the sides of the tongue, from the fact that this organ *rests* mainly against the palatal faces of the upper teeth, but they are apt to make the tip of the tongue sore from the constant desire to feel for them, which it is very difficult to restrain.

The ends of the ligature should be left quite long, that they may be manipulated outside of the mouth; one of the lingual ends and one of the buccal should be passed through the distal holes of the guard, and one lingual and one buccal through the mesial holes; the guard should then be placed in position, and the distal end secured by tying *with a square knot*; upon securing the mesial end in like manner a fixture will be adapted which is something remarkable for its firmness and for its comfortable efficiency.

The grooves prevent the knots from being bitten upon, and the ligatures from being cut by attrition.

If the ligated tooth is a "lone tooth," the two distal ligature ends should be passed through the distal holes of the guard, and the two mesial ends through the mesial holes.

"Absolute rest of the parts" having been guaranteed, it is usually advisable in these cases of "second grade" to indulge in limited degree in local medication (*third local consideration*, see DENTAL COSMOS, March, 1879, page 122).

For this purpose the *dental tincture of aconite* has always worked admirably with me. The gum above the affected tooth, and for a short

distance both mesially and distally, should be dried, and maintained dry; a small pellet of cotton should be dipped in the medicament, and the gum painted up to the reflection of the mucous membrane; the lip or cheek should be held away from the parts until the application is thoroughly dried, in order, 1st, that the effect of the medicine may be concentrated upon the desired location, and 2d, that the aconite may not be conducted by moisture to the cheek or lips, and above all to the tongue and fauces.

The after-treatment and final filling of these teeth is based upon the same general principles as those of easier management.

The "third grade" of periodontitis "develops, with sufficient celerity, excessive tenderness upon pressure, not only upon the tooth but upon all surrounding parts, pronounced throbbing, great pain, and general febrile excitement."

It is with this grade of periodontitis that the skill of the best informed practitioners is frequently taxed to its full extent; nothing less than the "utmost gentleness, accuracy, promptness, thoroughness, and persistence" will suffice for the relief of such pain and the saving of teeth affected by it.

All remarks pertaining to removal of cause in grades of lesser violence are applicable to these cases, but with very much increased attention to minutiae; gentleness of manipulation should govern every step of progressive instrumentation; extra attention should be given to the sharpness of drills; extra attention to the adaptation of counter-pressure; constant thoughtfulness of present suffering, and constant remembrance of need upon the part of the patient for occasional rest from infliction, should ever be apparent; unremitting vigilance over himself should be exercised by the practitioner lest he be betrayed into hasty, unpleasant comment upon *seemingly* needless apprehension and *seemingly* ridiculous inability to endure.

I must again call attention to the great need for knowledge concerning and recollection of the physiology of the "fifth pair,"—of its depth of origin, of its *peculiar* sensibility, of its distinctive characteristics as associated with apprehension, absence of control, excessive systemic disturbance, etc.,—and suggest that in these cases all such attributes are heightened by pathological intensifying, and *that, too*, in connection with decidedly perplexing temperamental complications.

Under such circumstances it is far better that the dentist should bear with equanimity the infliction of restlessness, fear, and lack of endurance on the part of those whom he is trying to relieve, than that they should endure the infliction of his impatience and want of sympathy, in addition to their really distressing suffering.

And, more than this, it is better *for dentistry*, when the battle is over and the victory is won, that the patients should truly feel disposed

to offer some excuse for their shortcomings in the hour of need, while giving hearty thanks for services rendered, than that the dentist should have his satisfaction at the happy termination alloyed by the thoughts of words which he would now fain recall, and which he is truly sorry to have spoken.

The *third local consideration* in treatment of inflammation is given as "the application of tonic, astringent, stimulant, counter-irritant, or sedative remedies, as the case may require."

In periodontitis of the "third grade" quite decided treatment under this third consideration is indicated.

First among sedatives is *blood-letting*. This oftentimes affords at once the most marked relief, and in so doing gives the necessary *time* for the effects of collateral treatment to become assured.

Blood-letting should be attained by *lancing the gums* freely, *as though for extraction*; in this way a copious outpouring of blood is secured, and it is drawn from parts most immediately in *contiguity* and *continuity* with the inflamed tissues.

(To be continued.)

DENTAL EDUCATION AS A SCIENCE.

BY A. H. THOMPSON, D.D.S., TOPEKA, KANSAS.

THE history of Dental Education in the United States may be conveniently divided into three periods, each possessed of well-marked distinguishing features, which may be appropriately named—like the three great geological epochs to which they may be happily compared—the *Primary*, the *Secondary*, and the *Tertiary* periods. That which occurred first is necessarily the germ, the primal organism, from which all that succeeded was developed in regular descent; the first period thus suggested and caused the evolution of the second, and the second the third; and from the first was also derived the germs which contained the potency for the development of not only all that has followed, but of that which is yet to succeed.

The transition from one period to another is not abrupt or always well-marked, but is effected by the gentle gliding of one into another, the gradual fading away of the first as the succeeding one slowly unfolds. So the process of evolution in this is also at work in the development of a perfect system of dental education. This development is undoubtedly in progress, even if we must admit that the germ of the perfect system is not yet incubated, for we do not yet discern it.

The *Primary* period of dental education in this country may be defined as that time which immediately succeeded the merest beginnings,

when the profession began to exist independently as a profession and special instruction began to prevail. Education for the practice of dentistry at first consisted of the merest trade apprenticeship, and all the knowledge considered necessary was procured through the irregular curriculum of the office, or by self-instruction. This education was largely "practical," and among other practical things the novice was taught the value of existing independently of servants by beginning at the office drudgery. The student was little better than a scullion, until he could by his own force and ability make himself necessary to his "master," when he was, perhaps, elevated to apprenticeship. Indeed, the nature of dental practice in those days rendered the trade apprenticeship system the only available method of education. Everything was mechanical. It was the day of the reign of "ingenuity," when the man who was "handy" with tools was necessarily a "born dentist" and took to it as a mechanical occupation. It was the time when only men of unusual genius could lift themselves above the herd by overcoming the obstacles in the way of attaining the semblance of a scientific knowledge of their calling by intelligent self-instruction. It required persistent endeavor, being unguided by teachers, to obtain knowledge, and through knowledge, true success; and the common man sunk down to the merest charlatanry because of the difficulties he could not surmount. Genius alone survived, and mediocrity went to the wall.

It was the time of mechanical art, but not of science, in dentistry, and therein was the cause of its failure as a profession. The giants of those days were scarcely more than excellent mechanics and artisans, fine jewelers, and perhaps good chemists, but they were not dental surgeons in the modern definition of the term; their work was governed but little by the scientific principles underlying it. The monuments of their skill and handiwork which remain to us, both prosthetic and operative, were their accidents, not their averages. It was the artistic ability of the fathers which laid the foundation for that world-wide reputation which American dentistry afterwards attained and for long years enjoyed, of being in the lead in artistic productions. But in our day it has become almost a reproach to us, for the European dentists say of us, that "The American dentist is artistic, but he is not scientific; he does fine things, but he does not know *why* he does them." Artistic dentistry has continued to rule down to our own day, and is still the bane of our educational systems, for it stands in the way of that thorough grounding in scientific principles upon which all true success must rest. There is still too much devotion to mere skill and artistic productions, with the result of the continued subordination of science to art in our education. The introduction of cohesive gold gave a new impetus to

this tendency, from which we have not yet recovered. The art of the Primary period necessarily made dental education then a mere apprenticeship, but the spirit of progress was abroad, and soon began to make itself felt in dentistry.

The advent of the *Secondary* period was heralded by the establishment of the Baltimore College of Dental Surgery. Among the "bright particular stars," the geniuses of the first era, who were mainly self-educated in dentistry, were a few medical graduates. Their knowledge of the sciences of medicine had given them a peculiar fitness for practicing dentistry, which they were not slow to appreciate. From the surmise, correct in the main, that dentistry was but a specialty of medicine, they went about establishing a college for the teaching of dentistry founded upon the system of the medical colleges. This was a great stride in advance, and marked the beginning of a new era for the profession. It was as far above the apprenticeship system as that was above nothing. The principle of the college system was, that to office teaching and practice should be added scientific instruction,—i.e., to lay the foundation after the building was erected. This was a great mistake, and inaugurated a principle which has been very harmful and which will be difficult to eradicate. It gave birth and credence to the idea among young men that office apprenticeship was the first and main thing, and that college instruction came after practical teaching, thus relegating the more necessary of the two, the scientific foundation, to the list of optional luxuries,—desirable but not essential. The system so works in practical operation to this day, ignoring the essential and indispensable principle of placing the science before the art, the theory before the practice, the knowledge of principles before the teaching of the application of principles.

This system in dental education has also been pernicious on account of the possibility it affords, of being put in practice in every town and hamlet throughout the land by any half-dozen dentists,—to satisfy their petty ambition, to air their half-learning, and perhaps turn a penny withal,—by "starting a college." Perhaps a greater curse was never inflicted upon a liberal profession than this same college system, which in its capacity for degrading possibilities, its mediocrity and superficiality, both in teachers and students, has brought upon us the annual inundations of half-taught, quarter-capable practitioners. Its capacity for being put in practice by anybody anywhere, and that, too, with dignity and the respect and recognition of the profession, is at once its weakness (by being brought into the disrepute unavoidably connected with its unlimited practice by incapable men), and its power (for evil in its results). It is, of course, founded upon the medical college system, but it is none the more respectable for that: the medical colleges are open to the same objections, have the same weakness,

possess the same power for evil, and are likewise flooding the land with incapable men.

But the Baltimore college did great good in its day, and, with the other colleges following, was eminently useful in its work. The graduates of that institution in its first decade may be called the "fathers" of modern dentistry, and the authors of all that is good and true in it to-day. The system served the profession well, did its whole duty, in fact, in producing those men and in introducing scientific instruction into dental education in any shape; for what of true science has crept in, has been due largely to that college and its early alumni,—the leaven of our professional cultus. But we have done with the cheap college system now,—let us away with it! It has outlived its utility, and is worse than useless in our day. The constant cheapening of degrees and lowering of the standards as the necessary accompaniment of the competition of half-starved institutions, makes of the sacred duty of education a mere huckstering business transaction, subject to all the vicissitudes of unprincipled competition, with the result of lessening the requirements for admission as well as for graduation, in order to "draw." The result is that the diploma of the average dental graduate is simply a lie. It certifies that the purchaser possesses the qualifications necessary to practice dentistry, which his instructors must have known, if they knew anything, that he did *not* possess, and never would, not even if he should put in practice afterwards that high-sounding notion of post-graduate study, but which he will be sure not to do, considering his diploma his evidence of fitness and deceiving even himself. He is not even aware of his ignorance.

We do not here refer to or denounce the men who are the honor of every class, who become the ornaments and leaders of the profession, for they succeed in defiance of college training and not because of it. The education of the colleges has little to do with their talents; it is merely an incident in their course of study, not an important epoch. The power of development is innate and normal in these men, and of that kind which succeeds in the teeth of disadvantages and obstacles. The same stamp of men in Primary times, with nothing but force of character to aid them, succeeded, and left to us a heritage of great deeds. Nor would we include the earnest men in every class, those who devoutly seek knowledge and know their ignorance, who succeed only by hard labor, because theirs is not the enfranchisement of genius: but we do mean the mediocre, or worse than mediocre graduates who are spawned by our colleges in shoals, with legal certificates of fitness to practice,—the only evidence of knowledge ever discovered about them. But especially we mean the disgraceful ignoramus, the shame of the class, the style of man who

"wonders if the professor of chemistry knows what he is talking about," and who does not see how a knowledge of anatomy can help him to make a rubber plate, or what bearing the theory of the circulation has on filling a "front tooth." He is a "*practical*" man, and goes to college to be made a dentist of—or get a diploma—in the shortest possible time, and has no time or money to waste on things which are of no use to him. For these reasons we appeal from the college system, the gift—the blessing and the curse—of the Secondary period.

The *Tertiary* period is that in which we have been living for a time, it having come upon us gradually, but it is not yet fairly inaugurated. It is characterized by post-collegiate office instruction in addition to the previous systems. The Primary consisted of office apprenticeship alone, and still prevails among the lowest strata, the non-graduates of the profession, the itinerants, etc. The Secondary consisted of collegiate training added to office apprenticeship, and is the characteristic education of the mediocrity of our ranks,—the mere "graduate" belongs to this class, which still obtains largely among us. The Tertiary system consists of office instruction (technically termed "preceptorship"), with college training and graduation, to which is now added post-collegiate office practice, that clinical practice, under the supervision of a proper instructor, so indispensable for the development of invaluable manipulative ability. This system possesses some claims to being scientific, for it places the instruction in the application of principles, *after* the learning of and grounding in those principles, such as that instruction is. This system is the best at present in vogue, and produces our best educated and most capable men. Its results demonstrate that it is a great advance upon previous systems, but it is capable of yet further development. It is perhaps the natural product of the former systems, and has inherited from them some defects; the office apprenticeship, for instance, is the rudiment of a once useful "organ," but we hope for its speedy abolition. We must hasten forward and seek for something yet better, the attainment of a distinctly new era, which may, perhaps, be appropriately named in advance, the Quaternary.

But where we are,—on the threshold of the Tertiary,—we look with anxiety towards the future. This anxiety is deep and wide-spread in the ranks of the profession, for there prevails an undefined fear for the future standards of knowledge, and as to what shall characterize the future curricula. With the college system tottering in our midst, with the diplomas being given for a modicum of knowledge, and with the lowering of standards in every direction, men are inquiring on every hand, How shall we educate our young men aright, that they may honorably and usefully discharge the duties devolving upon the mem-

bers of our profession? What shall be the means to the end of giving them the best education attainable? These are the burning questions of the day, and the earnest men in our ranks discuss them with energy and anxiety, for they are fraught with much of good or ill to the future of dentistry in this country.

How, then, shall we educate? It is, unfortunately, easier to criticise than to create. The defects of the old systems are easily indicated, but it is not so easy to draft and specify a new one which shall be perfect. Yet there are certain things which are natural and unmistakable. The diagnosis of the disease is easily made out, and the remedies are well known. We know our needs and possess the things required,—all that remains is the application. Then, why continue the pernicious and wicked trifling with the sacred duties of education which characterizes the present? Why leave these duties to irresponsible, mediocre, and superficial men? Let us break away from a thralldom that is dragging us deeper and lower each day, and leap upward into the light of something higher and better!

(To be continued.)

LIGHT-WEIGHT INSTRUMENTS UNDER THE DENTAL MALLET.

BY T. DWIGHT INGERSOLL, ERIE, PA.

COMPLAINTS are heard of pain endured under the dental mallet, which make an unfavorable impression upon the minds of those who have never been operated upon,—some to such a degree that they decide never to submit to an operation. Much of the pain is caused in preparing the cavity; and when teeth are sensitive to an excavator we may expect to find them more or less sensitive to the mallet.

Mallets are used of various weights, and if a light one will accomplish all that is necessary and cause less pain, it may be for the interest of the operator to use it; his reputation, in some measure, is at stake if he does not favor *some* of his patients in that way. No definite weight should be named for a mallet, as those varying in weight may be used for different teeth. If pain be lessened by the use of a lighter mallet,—it is reasonable to think so,—we have a hint to make an application of the same philosophy to our choice of pluggers, for *they* may also vary in weight.

Good serviceable pluggers may be made from steel from which excavators are manufactured. They would deliver the effect of a mallet quicker than heavier ones, and shock the tooth and nervous system less. This must be so, for any addition to the quantity of steel would give greater resistance, and require a more forcible blow or a mallet of greater weight; therefore any quantity of material in

addition to what is needed to prevent vibration, under a mallet of suitable weight, should be considered unnecessary. In the manufacture of these instruments the principles of mechanical motion of bodies should hold in subserviency ornate forms, and the operator's convenience should give way to feelings of humanity.

Experiments with points of automatic pluggers an inch and three-quarters in length, weighing only one pennyweight, indicate that a greater impact of gold is made with them than with the pluggers in common use,—seven inches long and weighing about sixteen pennyweights,—the malleting force being the same in each case. Pluggers an inch and three-quarters in length are too short, and seven-inch pluggers are sometimes too long, especially for those who are near-sighted.

Two extremes are here represented; their mean will be produced by manufacturers should there be a demand for it. It may be said that such instruments would be too small for convenience in handling, but a dentist is supposed to have a more delicate sense of touch than a blacksmith. A little experience enables him to handle deftly such as seem adapted to the work in hand, and with light ones he can judge of the effect of a blow better than with those that are heavy. A light plugger may be held slightly away from the work, in such a manner that when struck against the gold it will instantly recoil for another blow, and thus it may be moved over the surface while the mallet plays upon it rapidly, as if driven by machinery.

When a strangely formed cavity of decay is encountered, and there are good reasons for not cutting a gateway to a recess out of the range of vision, and no plugger is found suitable for direct action, a new one may in a short time be made from a broken excavator and adapted to that particular part of the cavity. The point may be serrated by pushing it along the cuts of a sharp file where there are no cross-cuts. Should it be necessary to direct the force of the mallet from the mouth outward, the point of the plugger may be bent backward into a hook of suitable curve, and the other end curved in an opposite direction, like an old fashioned pot-hook. When this "make-shift" is in position, a blow upon the outer hook will produce an effect quite as satisfactory as might be expected. To devise ways and means for filling every cavity, wherever located, when it is desired and seems best to try to save the tooth, should be the effort of every dentist. This requires more or less ingenuity and knowledge of the "mechanical powers," and shows us that a dental education should include more than is obtained at dental and medical colleges. To a want of such an education may be attributed the failure of some dentists in their efforts to save teeth by the use of gold.

This plea is made in the interest of humanity, and whoever miti-

gates the sufferings of one individual knowingly will feel in some measure self-rewarded, although he may not receive the thanks of his patient.

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR meeting held at the residence of Dr. W. H. Dwinelle, Tuesday evening, January 20, 1880.

President, Dr. W. A. Bronson, in the chair.

Dr. Francis, chairman of the committee appointed in reference to the death of Dr. S. S. White, submitted the following report, which was unanimously adopted:

The intelligence of the sudden and unexpected death of our friend and co-laborer, Dr. Samuel S. White, of Philadelphia, awakens within our hearts emotions of the most profound sorrow, and while bowing to the Divine Wisdom which has taken him away from us, we are impelled to take the first opportunity of paying a grateful tribute to his memory, and to give expression to our appreciation of him as a man. In so doing, our minds naturally revert to his earlier career, and thenceforward to the unfortunate hour which closed a life full of promise, usefulness, honor, and success.

All will bear testimony that he was a genial and cordial gentleman, of high culture and noble impulses, full of kindly charities, and always alive to the interests of our profession. With us he was ever a welcome guest, cheering and encouraging us in our aspirations, and giving character and tone to our deliberations.

His relations to our profession were of a peculiar character. He was one of us from the beginning. Commencing as a student, and following along through a varied career, his interests have ever run parallel with our development and growing needs. He was thus better qualified than any other man to respond to the demands of our ever-advancing profession. Enterprising even to daring, he never failed to take every rational opportunity to develop and establish any prospective good to our calling.

While recognizing the hand of Providence in thus removing from our midst, in the very fullness of his prime and usefulness, our friend, Dr. Samuel S. White, and while deploring our own loss, we do as a society tender to his family and friends our heartfelt expression of sympathy and condolence.

CHARLES E. FRANCIS,	} <i>Committee.</i>
BENJAMIN LORD,	
WILLIAM JARVIE, JR.,	
W. H. DWINELLE,	
A. L. NORTHPROP.	

Dr. W. H. Dwinelle. I can but pay a further tribute to our departed friend. I heartily indorse the spirit and sentiment of the report of the committee. More if possible was due to our friend, but words seem poor and meaningless to express our feelings while

under the shadow of a great sorrow like this. Dr. White, as intimated in the committee's report, was essentially one of us. He was our co-laborer, our brother professional and co-operator in the highest sense. I might say that the most important advancements in dentistry have been made during the life of our friend; commencing early in its career, he was enabled to know our needs, to sympathize with our necessities, and to co-operate in everything that had in view the enterprise and progress of our profession: he was educated to it, so that he knew its needs and requirements, and he ministered to them as no man ever did before, so that his success has been our success, his prosperity our prosperity. We have gone hand in hand with each other, engaged in the common cause to elevate and dignify our calling. No man has done more, in his field of labor, towards the advancement of our profession than Samuel S. White. It seems as though his place can never be supplied to us. While we mourn his loss, let us cherish his memory and imitate his virtues. "He was a man; take him for all in all, we shall ne'er look upon his like again."

Dr. C. E. Francis. It seems but a very short time since I attended the funeral of our late friend, Prof. McQuillen, in Philadelphia. Dr. White was present on that occasion, and he, with myself, carried the head of the casket containing the mortal remains of our departed friend to their last resting-place. I shall never forget the very great kindness of Dr. White at that time towards the bereaved family. He seemed almost angelic as he passed through the house giving consolation to the members of the family. I do not propose to offer any eulogy, but I will say this, that knowing Dr. White as I did, I consider him one of the most perfect men I ever knew. A great many have been benefited by his kind deeds. His virtues were legion, his shortcomings few.

Dr. Atkinson. I am just returned from the funeral of Dr. Samuel S. White, and am too much overcome to do justice to the memory of the only man I could tell my heart to and not feel afraid. He was my other self, and since he has gone I feel as if I were alone. I had no other such friend; I don't hope to have any such while my career holds out. That does not release me, however, from whatever I may do to help in my poor way the same class of men that he helped so eminently. My acquaintance is not small, my range of associations with good men is not little. I have associated with priests and governors and legislators and judges and men belonging to secret societies high in the orders, and he stands alone as the representative of my ideal of an honest man, with a conscious rectitude such as I never saw before. I have seen him in the heat of trial, when ruthlessly attacked in public by an individual under the excitement of his wrath

saying the most unkindly things to his face, and he stood steadily looking him in the eye and answered never a word; and when I, astonished, asked him how he could bear such treatment, he said, "I knew I was not the man he took me for, and I felt that I could afford to wait till he would find it out." He seemed to have been sent as from heaven at a time when, by the neglect of the teeth of the human frame by medical men, anatomists, physiologists, and pathologists, it became necessary to have a reorganization of the masticatory apparatus, and he, as has already been said, led the way, humbly always, lowly at first, but brilliantly and luminously up to the culmination of his bright career, that has so elevated the science that underlies our art that we cannot go back and practice the old methods that prevailed before the advent of Samuel S. White as a dentist, and as the supplier of the appliances and necessities of our art. There is too much involved in the history of such a man to permit of adequate justice being done to it on an occasion like this, even by his most ardent admirer, which I claim to be. I count it as one of the treasures of my life that I have known him, and I feel it my deepest affliction that I cannot see him face to face any more.

INCIDENTS OF PRACTICE.

Dr. A. C. Hawes. The president reminds me of a very interesting case upon which I experimented several years ago, for the restoration of a receding gum from a lower central incisor. The root was exposed for more than two-thirds of its entire length. I first made a rubber pocket for the protection of newly-formed tissue; then, by slight irritation and an occasional scarifying of the gums, granulations gradually and continuously formed from the sides and lower portion of the fissure, coming up to within a sixteenth of an inch of its normal condition. I consider it a perfect success, as far as treated. The operation was performed fifteen years ago, and the gum remains the same to the present time. I think Dr. Atkinson will recollect the case, as he saw it during the operation and fully indorsed my method of procedure.

Dr. W. H. Dwinelle. There is a superior molar that was a very badly diseased tooth in 1856. On examination I found that the lingual root was entirely dead,—a thorn in the flesh, irritating the gums and giving pain every time there was occlusion of the jaws. I found the two buccal roots in such good order that I resorted to a practice I often resort to, that of amputating the dead root. I amputated the palatal root, treated it successfully, and restored the two buccal roots to health, filled their nerve-canals, and built up a crown of gold on the superstructure. A few days ago I extracted the tooth. It was built up in 1856. It might have lasted a year or two longer, but

I thought it expedient to take it out, as I had some artificial work to put in, and this was rather in the way. I present you the tooth exactly as it came from the mouth. You will perceive that it is discolored, showing that the patient was a smoker.

A few years ago I amputated the posterior root of the first inferior molar, cut down and removed the half of the crown of the tooth corresponding to the dead root, filled its canal, and built up a gold crown upon what remained, making a bicuspid tooth of it, to all intents and purposes. To-day I have been operating almost entirely upon festoon cavities of the lower front teeth. You all know that irritation of the glands induces an increased flow of saliva, so much so that you cannot operate with facility. Not always caring to use the rubber dam for excavating cavities, I have a variety of small velvet sponges, which I use with great advantage to keep back the tide of saliva during such operations. I place one of these sponges immediately under the tongue and upon the sublingual ducts, which, acting as an absorbent and partial compress, leaves one comparatively free from all annoyance from the flow of saliva.

In 1850 I introduced *transfer paper* to the profession. I afterwards gave it the name of articulating paper. It had never been used in our profession before. Since then I have given it to hundreds of my brethren, describing the method of its use. In 1852 I operated in the office of Dr. Robinson, of London, and there exhibited the *paper* and described its uses. Although the application of this paper belongs to our profession, I find it has recently been *patented* in London, under the head of a "Patent and Highly Improved Articulating Paper." Carbon paper is quite as good and more lasting, and is very cheap. The transfer paper is very useful, not only in the artificial department, but in articulating crown fillings that are in excess. It is very useful in adapting pivot teeth to the roots, and in many other ways which will suggest themselves to you. It is an invaluable auxiliary to my daily practice.

Dr. G. A. Mills. The case instanced by Dr. Dwinelle reminds me of a similar one that came under my care while in Hartford five years ago. I excised and removed the dead palatal root of a second upper molar, and filled the pulp-chamber as well as I could with gutta-percha. The pericementum on the buccal roots being in a healthful state, the tooth remained and did good service.

Dr. Bogue. Dr. Dwinelle has forgotten to speak of another little convenience which I have many times availed myself of. When a patient comes in with a rubber plate chafing the mouth, I put a piece of postage stamp on the spot that is sore, with the gummed side to the plate. The plate then being put in place for a moment and again removed, it shows exactly where the plate needs easing.

A curious case came into my hands the other day. It was that of a young lady who, having lost a little gold from a lower bicuspid, went to a gentleman in Brooklyn to have it replaced. He replaced it, as he said, telling her the tooth would not last long, as it was getting loose. Three or four days passed and it grew rapidly looser. Three days later the tooth was abscessed. I drilled it from the grinding surface, and although there was plenty of evidence of the dead pulp in the root, I found nothing that satisfied me. My drill hit against something that made me think there was a broken broach in the root. I advised extracting it. To-day I took it out, and found the crown of the tooth broken off from the root at the neck. The tooth was filled from the lingual side. Two or three days since, when she bit bread with a small stone in it, she doubtless broke the tooth. It was held by a thread of gum at the margin. Upon finding what the matter was, I drilled the hole larger, put a gold screw through the crown and into the root, fastening the two together. I hope it will stay for a while.

Dr. Bödecker. A great necessity in dental operations is a perfect light. Every practitioner, I think, knows that most of the cavities we call difficult, such as the distal surfaces of molars and bicuspids, to a great extent are so because we cannot see them as well as those in the front of the mouth, and especially is this the case if the sky is cloudy.

Last summer Dr. E. Turnovsky, of Budapest, Hungary, was in my office when I used a bull's-eye condenser for collecting the rays of light of a common gas-burner upon a tooth which I was filling. He advised me to get a Grohnwald stomatoscope from Berlin, and upon his explaining to me the perfection of this light I ordered one, which arrived about two weeks ago. I have used this stomatoscope only a few times, but like it so well that I would rather be without my dental engine than part with this beautiful light. It illuminates the mouth of the patient so perfectly that I have looked up to near the apex of the pulp-canal of a lingual root of the first upper molar, the cavity being on the distal and grinding surface. I should have had the apparatus here to-night, but that it is rather heavy to carry, but I shall be happy to show it to any one who would like to see it and will come to my office.

Dr. Lord. Is it used with ordinary light?

Dr. Bödecker. It is made for artificial light. The apparatus is a kind of lantern, consisting of a tube about four inches in diameter and eight inches long. Through the middle of the latter is made an opening, which admits an argand gas-burner with a glass chimney. On the posterior end of the tube is placed a reflector, on the anterior is situated a thick plano-convex lens, which is fitted into a somewhat

smaller tube, and can be moved from and towards the light. To the upper surface of the main tube is fastened a rod about half an inch thick and twenty inches long, to which two mirrors (one plain and one concave) are attached, which, by means of compound ball-and-socket joints, can be moved to any desired position. The whole of this is mounted upon a heavy but nicely ornamented iron stand.

The rays of light produced by the argand burner are reflected by the posterior reflector, collected by the plano-convex lens, and thrown upon the concave mirror, from which the light is again reflected into the mouth of the patient. The focal distance of this concave mirror is between twelve and eighteen inches, and the size of the focus produced at that distance is from three to four inches in diameter; thus the eyes of the patient are not at all troubled by the light, that is, if the concave mirror which reflects the light is kept within the range of twelve to eighteen inches from the mouth.

The following paper, entitled "Alloys and Amalgams Chemically Considered," by J. Morgan Howe, M.D., was then read:

Since we know very little positively about alloys or amalgams, chemical theories relating to them may be of very little value; but it is only where we have not absolute knowledge that we may attempt the application of principles for the formulation of theories. A chemical theory on any subject is of importance to us, for the statement of our speculations will lead some either into larger fields of knowledge, or into sloughs of greater confusion. Ours may with some truth be called the amalgam age. And if we attach a certain significance to the invention of new alloys for amalgams, what marvelous progress may we not boast of! As there is a time for everything under the sun, so, no doubt, there is a place for everything, amalgam included; but surely amalgam is now having a fearfully large place given it, and its advocates are assuming heavy responsibilities. Claims that have been made by manufacturers, their directions for use, etc., have suggested certain inquiries as to the probable chemical nature of alloys and amalgams. I propose merely to state what our knowledge of the laws of chemical combination may lead us to expect of metals brought within the sphere of each other's chemism, and to state certain observations which appear to favor the view set forth.

Dr. H. S. Chase, in his journal,* advocating the use of amalgams, and especially of the material which he has called "stannous gold," proposes a chemical theory of alloys. He states that a chemical combination of metals will be made by melting them together in

* St. Louis Dental Quarterly, July, 1878.

"any multiple" of their "uniting proportions." The name "stannous" gold is also a chemical statement.

Dr. Chase is one of the fathers of the "New Departure"; he is supposed to be so fortunate as to be "peeping" through the "dental spy-glass," and hence his words, especially on a subject involving chemical reaction, are likely to be received by a great many with no slight attention. If I understand Dr. Chase, he claims a chemical combination in alloys which he has made *because* the metals were put together in the proportion of their "equivalents." Certain numbers are given as the "uniting proportions" of certain metals, and he then says "we can use any multiple of these numbers." This statement, the claim of chemical union for the reason given, and the name "stannous gold" applied to an alloy containing another metal than gold and tin, are all, it seems to me, misleading, unscientific, and entirely at variance with a clear, definite idea of what the chemistry of to-day teaches.

The advance of our own specialty, as well as the increase of general intelligence, demands of us that we shall be able to comprehend the laws of chemical science, and be able to apply them. What do we understand by chemism, and what are some of the evidences of its action?

Chemism produces such changes in matter that the resultant is entirely different from its constituents; it acts between atoms, and by changing their kind, number, or position in the molecule, makes the latter different from what it was: thus matter is changed, for the molecule is a perfect representative of the mass of homogeneous matter.

These changes in matter produce compounds of definite and fixed proportions, and whenever two or more kinds of atoms unite in varying proportions, those variations are in accordance with fixed laws, and the resulting compound is in each case a substance presenting entirely different qualities,—*e.g.*, calomel and corrosive sublimate are both compounds of mercury and chlorine; chemically they differ only in the fact that the former has two atoms of mercury in its molecule, the latter having but one. In other qualities they differ very widely, and no intermediate substance is known. On the other hand, mixtures of different kinds of matter may be made in any proportion whatever, and the resultant manifests properties, intermediate between those of its constituents, in a gradation of qualities according to the quantity of each. We see this in mixtures of different liquids, and in solutions of solids in liquids. Chemical compounds can be of only certain proportions. Mixtures may be of any proportion of the constituents. Most of the alloys present regular gradations of qualities according to the predominance of one or another metal, and it is

probably possible to melt together any proportion of the metals we commonly use in this way, so that every part of the resulting alloy will give evidence of the presence of each metal.

Mr. R. S. Williams has demonstrated that one-thousandth, or even less, of some metals, added to pure gold, will change the qualities of every grain of the mass, and that gold foil so made has peculiar qualities quite different from that made of pure gold.

Dr. G. F. Reese has made an alloy, for a base for artificial dentures, of one part of gold, two of silver, and twenty of tin. He has experienced some difficulties "in getting a small amount of gold thoroughly mixed through a mass of tin," but has succeeded. I apprehend the difficulties to have been of a physical rather than of a chemical nature. In each of these alloys, if there existed an affinity between the metals which was not easily prevented from causing union, there must be in some parts of the mass a chemical compound, and in other parts a pure single metal or a mixture, so that all parts of the mass could not be the same, or even similar.

We observe various colors produced upon the surface of jewelry; most of these are, I think, the result of the action of acids on the individual molecules of each metal on the surface; the action being similar to what it would be if the separate metals were exposed singly to the same reagent. If this action of reagents upon the surface of an alloy were the breaking up of a molecule composed of atoms of the various metals in the alloy, I conceive that there would be a disintegration of the mass; but as the action consists for the most part of the removal of certain molecules (atom by atom) of individual metals, the cohesion between the remaining molecules is not affected, and the surface only is acted upon. Some alloys present certain peculiarities, such as change of the melting-point from the mean of the melting-points of the constituents, or change of the action of reagents, from their action on the separate metals,—*e.g.*, nitric acid will not affect platinum alone, but it is said that when the latter is alloyed with silver it may be dissolved by nitric acid. Such changes as these may indicate a chemical compound in the alloy, or they may, in some instances, be explained as examples of catalysis. In melting some metals together there are rapid rises in the temperature, or on cooling, the regular fall of the temperature is arrested for a time; or a tendency of a part to crystallize differently or more quickly than the remainder of the mass is observed. These are regarded as evidences of chemical action; but the feeble nature of the force manifested is shown in the fact that we may entirely prevent one part of the alloy from being materially different from the rest by energetic stirring of the molten mass or by a very sudden cooling. It is true that many metals are capable of forming what seems to be a chemical combi-

nation with each other, and from what we know of chemical union between other elements, if it takes place at all, *it is true* chemical combination. In those instances, however, in which it occurs at high temperatures, we have in most cases no evidence that the union is a stable one, and we are not warranted, I think, in assuming that the union continues after the temperature falls to the solidifying point without proof that such is the fact. Differences in crystallization, or in other physical qualities, are such proofs; and when we do have such evidences of new and definite compounds being formed, we know that the union that has occurred has been in exact accordance with the quantity of combining power, or quantivalence, of the elements so united. The qualities which are peculiar to any such compound may or may not be in some way like the constituents, but there is always a distinct difference, and there is no possibility of producing gradations of these qualities. Without proofs we are not warranted in concluding that chemism has produced a change, and if it has not we have only a mixture. Mathiessen* has before been quoted on this subject. He regards it as probable that an alloy is either, 1. A solution of one metal in another. 2. A chemical combination. 3. A mechanical mixture. 4. A solution or mixture of two or all of the above. In these four different descriptions of condition, there is only one of chemical union; the other three are descriptions of mixtures of the molecules of the metals that constitute the mass, or mixtures of these with the molecules of the chemical compound. Since we do not have proof in most alloys of chemical union, and do have, in most cases, evidence that the mass is one of heterogeneous matter, we are warranted, I think, in regarding most alloys as mixtures of the molecules.

I have already called to your remembrance the law of the quantivalence of atoms, in the fact that a chemical compound can be the result of one fixed proportion only of its constituents, and that a union of other proportions produces an entirely different substance. Those elements that change their quantivalence do so by fixed law, and not in "any multiple" or proportion; the change is always by two, so that artiads and perissads always remain such. The conception of the quantivalence of atoms is represented as a number of bonds reaching out to unite with others. These bonds of affinity are regarded as always engaged; and atoms thus united, if alike, form molecules of simple or elementary matter; if the atoms are unlike, molecules of compound matter are formed. When two or more kinds of matter are brought within the sphere of their respective chemism, the atoms in the differing molecules rearrange themselves, *if induced*

* British Association Reports, 1863, p. 97.

by a greater attraction than that which now holds them; otherwise there is no change.

The laws of quantivalence cannot be ignored in any intelligent consideration of chemical compounds. Sodium chloride (NaCl) is always composed of one atom each of the two elements, and water is always made up of two atoms of hydrogen and one of oxygen (H_2O). There are two chlorides of gold, auric chloride (AuCl_3) and aurous chloride (AuCl); there are two oxides of tin, stannic oxide (SnO_2) and stannous oxide (SnO). In these compounds the gold and the tin change their combining proportions, forming in each case different compounds, each molecule of which is complete, the affinity of the atoms composing them being satisfied.

If we suppose now that tin and gold form a chemical combination, we remember that tin is known to unite with two and four bonds, and gold with either one or three bonds. If we have tin manifesting its lower quantity of combining power, and gold also combining with its lowest quantivalence, SnAu_2 would be the formula representing such a union. If, however, tin should act the same as before, and gold unite as a triad, Sn_3Au_2 would represent the resulting compound. Either of these formulæ may be called stannous gold. The proportion of gold, by weight, in the latter compound would be over 52.6 per cent.; in the former it would be much more. I do not know of any other possible compounds of these metals that have a right to this name; and unless gold is capable of acting as a pentad or heptad, the above proportion of gold is the least that there could be in *stannous gold*.

I suggest that most of the alloys are probably mixtures, and that mercury forms a union with each metal separately. If this is so, what is the advantage in the use of an alloy for amalgams over a mere mechanical mixture of filings? Suppose we have an alloy of two metals which is entitled to a chemical name,—the chemism of the atoms of each metal satisfied in union with another,—if we wish to introduce into such a molecule one or more other atoms, *e.g.* mercury, the bonds which are now satisfied must be disengaged by the power of a greater attraction; and when thus disengaged, each atom may, and in most cases probably will, satisfy its affinity for mercury by uniting with those atoms nearest to it, and the resulting combination will be much the same as if infinitely small particles of the two original metals had been merely mechanically mixed together. There may in the case of either an alloy or a mechanical mixture of two metals result from amalgamation a molecule containing atoms of all three of the metals; or there may result molecules of two kinds,—those containing mercury and one of the metals, and those containing mercury and the other metal. The difference resulting from the

amalgamation of filings of an alloy, and a mixture of filings of the metals composing it, would in most cases be because of the very much more perfect subdivision in the alloy than in the mixture.

Dr. Chase, in writing of an alloy of tin and silver, in which he concludes that part of the mass is a chemical combination of tin and silver, and part pure tin, supposing it to be amalgamated, says, "we have two kinds of amalgam in the same plug,—one of silver and tin *chemically united*, and one of the surplus tin alone." Now, supposing amalgamation to be a chemical reaction, I think it safe to say that while the silver and tin are chemically united their union with mercury is impossible; the bonds of affinity which unite them are disengaged in the very act of forming a combination with mercury; and whether the molecules of amalgam would contain mercury, tin, and silver, or some be composed of atoms of mercury and tin, and others of mercury and silver, would be the result of other causes probably than the previously supposed chemical union of the tin and silver. Indeed, it seems very probable that all our amalgams are heterogeneous compounds, and that the mercury combines separately with many, if not all, of the metals of our alloys. Dr. Chase appears to me to indorse this view when in his directions for using "stannous gold" he advises against squeezing out an excess of mercury, and says "the gold will come out with the quicksilver." It seems clear that he does not consider the mercury to be united to the *chemically united* metals of the alloy. Mr. Fletcher also says that mercury "cannot be squeezed out without very seriously damaging the properties of the mass;" and although he does not give his reason for the statement, it is presumably the same as that of Dr. Chase on that point. In order to ascertain the qualities of amalgams made with metals mixed mechanically, I mixed

1st Test—10 grains tin foil,
 8 " precip. silver,
 2 " " gold.

These metals amalgamated with ten grains of mercury made a rather dry mass, but it packed well in a small glass cup and endured tests for leakage well.

2d Test—1 grain platinum, black,
 1 " precip. gold,
 13½ grains " silver,
 20 " tin foil.

This mixture took almost an equal weight of mercury to make it easily worked, but it made a tight plug in a glass cup; was rather soft when set. Both these tests were put in water colored with aniline red after they were set, with similar tests of Fletcher's plati-

num amalgam, "stannous gold," and "standard alloy." In each case as perfect a plug was made as possible; the cups in which the amalgam was packed were six millimeters in diameter inside. The amalgams made with mixtures stood this test for leakage as well as the others.

3d *Test*.—Tin filings (commercial tin), 12 grains,
Silver filings, 8 "

With 14 grains of mercury this made a very plastic mass, but twenty-four hours after packing in a glass cup it had not set at all.

4th *Test*, same as No. 3, except the addition of two grains pure gold filings. At the end of twenty-four hours this amalgam was somewhat hardened, but it took several days to set entirely, and then it was not very hard. In these two last cases I thought that the result so unfavorable to the idea of a mixture might be caused by the very imperfect subdivision of the silver by the file, and its comparative insolubility in mercury, it thus not having an opportunity to exert its usual influence in causing the mass to set. I then mixed

5th *Test*.—12 grains tin filings,
8 " precip. silver.

This was mixed with mercury at the same time and in the same way as

6th *Test*, an alloy containing the same proportions of tin and silver as the last test. In three and a half hours both of these last tests were considerably hardened, and in this respect I could discover no difference between them. Eight hours after packing them in the glass cups, the amalgam made from the alloy seemed to be somewhat the hardest. These results seemed to confirm to some extent the view that quick setting was induced by the silver when in a condition of minute subdivision, which influence it could not exert to nearly so great an extent when in the form of filings. And all of the tests may in a measure favor the idea that the alloying of metals for amalgams is mostly of advantage from the fact of its producing a more thorough mixing, and more minute division and separation of the molecules than can be accomplished in any other way.

If amalgamation is a chemical process, the stability of amalgams depends on the quality of the chemism between the mercury and the metals. Now that we are having a new alloy offered us almost weekly, with all imaginable desirable qualities, and presumably containing all possible metals, we may not, with too much confidence, rest on the idea that the possibility of mercury's affecting the system by escaping from an amalgam plug is a delusion. Merget* has shown that mercury is vaporized at all temperatures between $+25^{\circ}$ and

* Watt's Dictionary of Chemistry, Supplement, 1875.

—44° C., and that the vapor has considerable diffusive power. If any mercury in a dental plug is released from its combination with any metal in the mass, the result is possibly an effect upon the system which may or may not be apparent. It must be confessed, however, that clear evidences of any such effects having been produced are, so far as I am aware, wanting.

I thank you for your attention, and shall hope that, if these suggestions as to the chemical relation of metals, in alloys and amalgams, seem to be of little practical value, yet the effort to apply the principles of chemistry to the subject under consideration may freshen our memory as to the accepted theory of the mode in which molecules are built up and again disintegrated. With the laws which govern these processes we cannot be too familiar.

Discussion.

Dr. Bogue. Dr. Howe's researches seem to me to point clearly in the same direction as some I had the pleasure of making some years ago, namely, that the more metals that are put into an amalgam filling the less is it adapted for constant use as a plug in decaying cavities of teeth; and while on this subject I would like to offer my view of Dr. Flagg's now famous remark, that "in proportion as teeth need saving, gold is the worst material for saving them." That is eminently true of amalgam, and in proportion as cavities are small amalgam improves in its quality as a plug. I embrace this opportunity to speak of that statement of Dr. Flagg's, for it seems to me to be doing mischief. As I look on my work from day to day, necessarily I see the work of other gentlemen, whose skill I am sure cannot be any less than mine, and I find their large amalgam plugs giving way woefully. But I notice that smaller amalgam plugs do not give way so readily. The circumference is less and the contraction is less. The inference to which Dr. Howe leads us, that the greater the number of metals the worse the amalgam, is the same to which I was led when I found, as some of you will remember, that copper and palladium alone, of all the twelve different substances I experimented with, did not shrink in congelation. Those two did not shrink, those two did not expand. Every other combination with mercury that I tried shrunk or expanded, or did both, and the general tendency seemed to be towards assuming a spherical shape. It seems to me that another thing has been overlooked by our friends of the New Departure, with whom, in the extreme ground they occupy, I must say I have very little sympathy. While it may be true that gold is the worst material in proportion as teeth need saving, I believe it is true only from the fact that the human hand, brain, and eye are limited in their powers of endurance, both as re-

gards patients and operator; and when teeth are so badly decayed as to require hours for us to prepare and fill them with gold, it becomes a question whether gold shall be used. Sometimes it is no longer a question: nature settles it; gold should not be used; but the claim that gold is the worst material *per se* seems to me radically wrong. I think within the past week I have seen side by side amalgam fillings going to ruin and gold fillings which were older standing securely. The amalgam fillings may have been put in hastily,—so much the worse for those who put them in. The cavities may not have been properly prepared,—so much the worse again for the operator. But the fact still remains that the same operator will put in large gold fillings, and have them stand in the same mouth in which his amalgam fillings will often fail. It seems to me that the fault is to be found in the material used to a large extent, for as yet I believe no combination of metals other than a single one with the mercury has been found that will not to a greater or less degree change its form. To be sure, we may recognize that fact and work in accordance with it. I for one should be very glad to see this subject discussed in the same intelligent manner in which it has been begun this evening.

Dr. Perry. Do you still use palladium, and with the same satisfactory results as when first reported?

Dr. Bogue. Yes, sir; entirely.

Dr. A. H. Brockway. I see nothing inconsistent with Dr. Bogue's views as just expressed in the aphorism, that "in proportion as teeth need saving gold is the worst material to use." I get no hint from this that amalgam, and perhaps an indifferent amalgam at that, is the proper thing to use. It seems to me that this aphorism should be taken in a liberal, intelligent spirit, with a realization of the difficulty of using gold successfully in such cases, and of the comparative ease of using a plastic material to the salvation of the tooth. It must be a common experience that cases are not infrequently presented where, if one is truly desirous to *save* the organs intrusted to his care, common sense dictates that some material other than gold—be it amalgam, the mineral cements, or gutta-percha—must be used to secure that result, and I believe that the researches of such men as Dr. Bogue and Dr. Howe on the subject of amalgams will be of great benefit to the profession in helping us to a better amalgam. I believe that many of the amalgams offered to us are in the very nature of their composition unfit for the purpose they are intended to serve. Where failure occurs from the use of such, it should in fairness no more be charged to the fault of amalgam *per se* than should many of the failures which occur in the use of gold be charged to the fault of that material *per se*.

I believe that with a good amalgam, say one of palladium and

mercury, or of copper and mercury, a perfect *preservative* filling—saying nothing of other considerations—can be made in nearly every case where any filling can be used.

Dr. Bogue. I hardly need to say I am not able before my brethren to speak as I should in conversation. I should not differ with Dr. Brockway, nor did I mean to intimate that the two amalgams of copper and palladium were open to the objection of changing their shape that all mixed metals are; neither could I find fault with the aphorism presented by Dr. Flagg were it not the first of a series of aphorisms which lead on by insensible gradations to the extolling of amalgam at first, and a certain amalgam at last. To that I make objection, and venture at the same moment to repeat that my past experience for the last four or six years corresponds entirely with the theoretical experience reached before that time, when I was searching, against all the prejudices of my life and professional education, and against the expressed wishes of some professional friends, for something that might take the place of gold in those cases where myself and my patients were taxed to an extent which I felt was entirely improper. That certain amalgams do to a great extent fill that gap is unquestioned; that certain others do not, I think is just as true. That palladium makes absolutely one of the best fillings that has ever been put into the decayed cavity of a tooth, I firmly believe. That is saying a great deal. But it has some objectionable features that will prevent its extended use. The last I got cost me forty-two dollars per ounce. Patients will not pay that price for a material for common use. In the second place, it is as black as your hat. It blackens the filling but not the tooth. Then it sets quickly, and if not successfully put in, it becomes so hard that it is almost impossible to get it out.

Dr. Dwinelle. How about copper amalgam?

Dr. Bogue. Copper amalgam does not contract.

Dr. Dwinelle. Does it not discolor the teeth?

Dr. Bogue. I have seen many teeth that were discolored by it, and many that were not. Dr. Rogers showed me the process of making copper amalgam, and made a considerable quantity for me that contained a comparatively small amount of mercury. He has it in his own teeth, put in by his father twenty years ago, and it has worn admirably. The teeth are not discolored, and I find it very hard and uniform, answering the purpose of a good filling. I have seen quite a number of copper amalgam fillings upon the grinding surfaces of teeth, where the discoloration of the teeth was not appreciable, and the discoloration of the filling very slight,—no greater than in the ordinary amalgam plugs; the same amalgam put on one side where the brush did not touch would turn dark. This amalgam, so far as I know, does not turn the tooth dark. I see other copper amalgams

which do turn the teeth dark, and turn them green. I have used this copper amalgam occasionally, but have not carried the experiments with it far enough to feel secure in using it always, though I think it a preventive of decay where other materials have failed, and I should look upon it as next to palladium.

I will state Dr. Rogers's manipulation, if the gentlemen care to know about its preparation. Sulphate of copper was dissolved in water until the solution was a saturated one. Clean plates of zinc were then suspended in this solution, until there was a deposit of copper on the zinc and at the bottom of the vessel; then mercury was poured abundantly into the precipitate. In a day or two there was an amalgamation of the copper with the mercury. It was then taken out, a perfectly soft mass, and worked in the hands and washed with water, and eventually squeezed in a cloth to get rid of the surplus mercury, and set by to harden. After hardening it was heated till soft, and rubbed again and again, and squeezed, and that process was repeated twenty or thirty times, perhaps, until the result was a mass which allowed very little mercury to escape from squeezing in buckskin, and which was light in color. It was then rolled out in sticks as large as a pen-handle, which could be broken. The method of using is to warm it until the mass sweats mercury, and then rub it in a mortar until it becomes a powder, which, upon rubbing in the hands, becomes sufficiently plastic to put into the tooth. From that again mercury can be squeezed. If desired it can be brought down to a point where it will begin to get hard in four or five minutes. From it were made the fillings that have discolored so little, and around which I have never seen any leakage or discoloration of the tooth.

Dr. Bödecker. About ten years ago, when I was in England, Mr. King used this copper amalgam, which he made himself. He told me he was using it in cheap work only, on account of its looking so black. But he found that it saved the teeth better than a more expensive amalgam. This latter he used principally where the filling would show, but very often the cheap amalgam would do better service than the more expensive one. I have seen a good many of these fillings; they looked quite black, but preserved the teeth.

Dr. S. G. Perry. For a number of years I have had good service from amalgam by using it in a manner that I do not remember to have heard mentioned by any one. I sometimes fill large cavities in the back teeth with it, and after a few days, when it is hard, I cut a groove around the edge of the filling, completely exposing the edge of the tooth. Into this groove I pack gold, and thus secure the edge of the tooth from the future crumbling that would follow the shrinkage of the amalgam. In this way I can easily restore the form of the tooth, and as securely protect it as by filling with gold throughout.

If the filling is a large approximal one, I commence the groove as far under the gum as I can get on the buccal side, and extend it all the way around the filling to the gum, or a little way under the gum, if possible, on the lingual side. Along the cervical wall in large fillings that run well up under the gum I do not look for early failure, even if an amalgam filling is used. I hardly expect you to agree with me as to the safety of the cervical border under such fillings, yet if the edge of the filling has been well finished after the amalgam has set, I have but little fear of failure at this point. My large approximal amalgam fillings have failed from the crumbling of the enamel on the approximo-grinding corners and along the grinding surface, oftener than at the cervical wall.

By following the method above detailed I have restored many badly-decayed teeth to permanent usefulness. With the plastic amalgam I can easily shape the fillings to my liking, and the narrow band of gold insures a fine and lasting edge. Formerly I made the same groove, and filled it with amalgam, but I found that this narrow band would in time show slight shrinkage. During my whole professional life I have never hesitated to put two metals in contact in the same tooth. I know there is a prejudice against such practice, but if harm ever comes I have never observed it.

Assuming the truth of Dr. Bogue's statement, "the smaller the filling the less the shrinkage," I have had from amalgam another quite distinct service, by using it in small cavities on the grinding surfaces, and occasionally on the buccal sides of the molars. A small cavity so situated that its whole circumference is exposed to the friction of food, or the brush, may be very securely filled with amalgam. The fissures in the crowns of the lower molars are peculiarly favorable places for it, since it can there be used in a form so dry and powdery as to harden quickly and shrink but little.

For young children, unless the conditions are very favorable for the use of gold, it has long been my habit to fill the fissures in the molars with amalgam or tin,—generally with tin in the upper and with amalgam in the lower. When it is required, I do this at the earliest moment, often before the teeth are fairly through the gum. At such times it is difficult to use gold successfully, and I have had great service from amalgam, expecting to substitute gold in a few years' time, when the conditions will be more favorable for making permanent fillings.

But I have found in a great many cases that these amalgam fillings do so well that I do not change them for gold. I am content to let them remain as long as they are safe, reserving my time and strength for such cavities as require great care in the use of gold. For nearly all of my patients I find so many such cavities, that I cannot feel

that I am justified in spending an unnecessary moment upon these simpler ones that almost save themselves. I do not care to put in gold fillings merely to make the mouth look well, or for the sake of having something handsome to show to my professional friends. I think I have a higher duty to perform than to make a jewelry establishment of the mouth. I am better content to *save teeth*, and if I can do it in an easier way and with less expense to my patients, I will willingly bear the criticism I may receive at the hands of some of my professional brethren.

But, unfortunately, the number of cavities that can be permanently filled with amalgam is comparatively small, so that I am compelled to use gold for most of my work.

It is probable that my experience in the use of amalgam has been different from that of most of the gentlemen present. While many have been led by the New Departure doctrine to a freer use of amalgam, I have been gradually using it less and less. But this is easily accounted for. A few years ago some of you did not use amalgam at all. I have always used it. I came into the profession under the guidance of a preceptor who used it in great quantities, and it took me many years to break the habit of its rather free use. As I have acquired greater ease in the use of gold, I have been encouraged to use it more in many of those difficult places where I had formerly used amalgam.

Dr. Bogue. At the risk of speaking too often, I want to call attention to the use of palladium in cases where the cervical margins of enormous gold fillings have broken down,—failures that give us the heartache. I have many times excavated and filled with palladium under the gum, in many cases where the moisture was uncontrollable.

Dr. Perry. Right in the moisture?

Dr. Bogue. Straight into it. I could not help myself; but you know that palladium amalgam sets hard in from half a minute to a minute and one-half, and you can do somewhat better from that circumstance.

Dr. Perry. I venture to say you saved the tooth many times.

Dr. Bogue. Yes, sir; I think so, and without destroying the gold filling already in it. A gentleman in Cologne put in better shape than that an idea which I would give him credit for by name if I remembered it at this moment, which was that he used any ordinary amalgam for filling the upper or cervical portion of an approximal cavity in a tooth and let the amalgam set, and then finished with gold. The idea in that shape was a little different from anything I had heard.

Dr. Dwinelle. There is a tooth which was filled with amalgam

by an excellent operator, and it failed. I filled with gold in 1857, and it stood there until about six months ago. Another man took it out under the thought that it created toothache. It did not, however. He had to take out two others before he found the right one. We are giving instances where amalgam takes the place of gold. I now present a case where gold has proved superior to amalgam. The tooth was filled with crystal gold. We should be influenced by the conditions of the mouth before deciding upon the material to use.

Adjourned.

NEW DENTAL ORGANIZATION.

IN response to an invitation circular sent to all the prominent dentists of Hudson, Essex, and Union Counties, New Jersey, some thirty practitioners were present at the office of Dr. W. Pinney, Newark, on Thursday evening, February 26, and formed a society for the general advancement of the interests of the profession in the counties named. A constitution and by-laws were adopted, and officers were elected as follows:

President.—Dr. D. C. McNaughton, Jersey City.

Vice-President.—Dr. Worthington Pinney, Newark.

Secretary.—Dr. G. Carleton Brown, Elizabeth.

Treasurer.—Dr. C. A. Meeker, Newark.

Executive Committee.—Drs. James C. Clark, Jersey City; F. Barlow, Jersey City; E. F. Hanks, Jersey City; F. A. Levy, Orange; J. C. Hanks, Newark.

The new association starts off with many wishes for its success, and no doubt will soon take a prominent position among local dental organizations.

G. CARLETON BROWN, *Secretary*.

ALUMNI ASSOCIATION OF THE BOSTON DENTAL COLLEGE.

AT the annual meeting of the Alumni of the Boston Dental College, held at the college building March 3, 1880, the following were elected officers for the ensuing year:

President.—Dr. William P. Leavitt, Boston, Mass.

1st Vice-President.—Dr. Lory B. Fenderson, South Boston, Mass.

2nd Vice-President.—Dr. William Barker, Providence, R. I.

Secretary.—Dr. Edgar O. Kinsman, Cambridge, Mass.

Treasurer.—Dr. George C. Ainsworth, Boston, Mass.

Executive Committee.—Drs. C. H. Osgood, N. N. Noyes, of Boston, and T. W. Clements, of Brookline, Mass.

E. O. KINSMAN, *Secretary*.

MISSISSIPPI DENTAL ASSOCIATION.

THE fifth annual meeting of the Mississippi Dental Association was held in Jackson, January 19, 1880, Dr. A. H. Hilzheim in the chair. The Association having resolved itself into a Committee of the Whole, prepared a bill to regulate the practice of dentistry in the State of Mississippi, in the earnest hope that the Legislature would make it a law. The following officers were elected for the ensuing year:

President.—Dr. R. J. Miller.

Vice-President.—Dr. J. D. Miles.

Secretary and Treasurer.—Dr. C. C. Marshall.

Executive Committee.—Drs. G. W. Rembert, J. D. Miles, and W. T. Martin.

Delegates to the Southern Dental Association.—Drs. J. D. Miles and T. O. Payne.

Delegates to the American Dental Association.—Drs. G. W. Rembert and W. H. Marshall.

Delegates to the American Dental Convention.—Drs. A. H. Hilzheim and W. T. Martin.

Adjourned to meet at Oxford, Mississippi, on the third Tuesday in May, 1881.

C. C. MARSHALL, *Secretary.*

KANSAS STATE DENTAL ASSOCIATION.

THE next regular meeting of the Kansas State Dental Association will be held at Emporia, Kansas, on the first Tuesday in May, 1880. Reduced rates at hotels have been procured for those in attendance. An unusually interesting meeting is anticipated, and the profession throughout the State are cordially invited to be present.

R. I. PEARSON, *Secretary.*

GEORGIA STATE DENTAL SOCIETY.

THE twelfth annual session of the Georgia State Dental Society will be held in the city of Atlanta, commencing on Tuesday, the 11th day of May, 1880, at ten A.M.

L. D. CARPENTER,
Corresponding Secretary.

BALTIMORE COLLEGE OF DENTAL SURGERY.

THE fortieth annual commencement of the Baltimore College of Dental Surgery was held in the Academy of Music, Baltimore, Md., on Thursday, March 4, 1880, at half-past seven o'clock.

The valedictory address was delivered by General Bradley T. Johnson, and the class address by Burrows Nelson, D.D.S.

The number of matriculates for the session was seventy-three.

The degree of D.D.S. was conferred on the following members (forty) of the graduating class by Professor F. J. S. Gorgas, Dean :

NAME.	RESIDENCE.	THESIS.
C. James Barber.....	New York.....	Neuralgia Faciei.
Frank A. Barrett.....	Dist. of Columbia...	Alveolar Abscess.
John D. Basehore	Pennsylvania.....	Neuralgia.
John S. Billopp.....	Maryland.....	Irregularity of the Teeth.
John H. Burnett.....	South Carolina.....	Sensitive Dentine.
Oscar Frederick Coe.....	New York.....	Pericementitis.
Frederick H. Cole.....	New York.....	Anatomy of the Teeth.
Pastor A. Cooke.....	South America.....	Irritation.
H. V. Desportes.....	South Carolina.....	Treatment of the Dental Pulp.
Josiah W. Foreman.....	Virginia	Dental Replacements.
James W. Gorden.....	Maryland.....	Preservation of the Dental Organs.
Milton H. Gross.....	Pennsylvania.....	Inflammation.
William T. Harban.....	Maryland.....	Dental Caries.
Joseph S. Hartman.....	Virginia	Irregularity of the Teeth.
William Hawkins.....	Tennessee.....	Extraction of Teeth.
Garnett L. Hills.....	Dist. of Columbia...	The Temporary Teeth.
N. A. Hollinshead.....	Georgia.....	Dental Irregularities.
B. Merrill R. Hopkinson.....	Maryland.....	Replacement of Oral Organs.
Louis C. F. Hugo.....	Dist. of Columbia...	Irregularities of the Teeth.
Thomas May Hunter.....	North Carolina.....	Dental Caries.
Albert B. King.....	Maryland.....	Dental Caries.
Alexander Leeds.....	Maryland.....	Diseases of Dental Pulp.
Frank P. Lewis.....	Pennsylvania.....	Stomatitis.
Burrows Nelson.....	Dist. of Columbia...	The Antrum and its Diseases.
Carl H. E. Obermuller.....	Germany.....	Fracture of the Inferior Maxillary.
John C. Oeland.....	South Carolina.....	Alveolar Abscess.
Elisha T. Payne.....	New York.....	Methods of Practice from Experience.
Samuel A. Peden.....	Pennsylvania.....	Plaster of Paris for Impressions.
James A. Peirce.....	Virginia	Irregularities of the Teeth.
Marion Pirkey.....	Virginia	Preservation of the Teeth.
Joseph M. Quattlebaum.....	South Carolina.....	Materials for Filling Teeth.
Henry L. Rankin.....	Virginia	Digestion.
Abraham V. Robbins.....	Pennsylvania.....	The Brain.
J. Ryerson Smith.....	South Carolina.....	The Mandible.
Millard F. Thompson.....	Dist. of Columbia...	Irregularities of the Teeth.
Louis A. Thurber.....	Louisiana.....	Development of Tooth Structure.
John H. Twyman.....	Kentucky.....	Neuralgia.
J. N. Van de Water.....	New York.....	Operative Dentistry.
Louis G. Wietfeldt.....	Germany.....	Irregularities of the Teeth.
John L. Wolf, M.D.....	Dist. of Columbia...	Operative Dentistry.

HONORARY DEGREE.

Thomas Brian Gunning.....New York.

OHIO COLLEGE OF DENTAL SURGERY.

THE thirty-fourth annual commencement of the Ohio College of Dental Surgery was held at College Hall, Cincinnati, Ohio, on Wednesday evening, March 3, 1880.

The address to the graduates was delivered by Rev. James Eells, D.D., the valedictory address by M. S. Dean, D.D.S., and the class oration by E. A. Galbrath, D.D.S.

The number of matriculates for the session was seventy.

The degree of D.D.S. was conferred on the following members of the graduating class by G. W. Keely, D.D.S., President of the Board of Trustees:

NAME.	RESIDENCE.	THESIS.
Ira Athern.....	Ohio.....	Dentition.
Will B. Ames.....	Ohio.....	Oral Chemistry.
David Arter.....	Ohio.....	The Human Skull.
John O. Bockstoce.....	Pennsylvania.....	Bone Structure and Ossification.
F. O. Brake.....	Ohio.....	Preparation and Filling Root Canals.
J. M. Clyde.....	Kentucky.....	Animal Heat.
G. M. Cole.....	Pennsylvania.....	Is Dental Caries accompanied by Inflammatory Action?
M. H. Fletcher.....	Indiana.....	Nerves of the Face and their Office.
Hubert H. Gott.....	Ohio.....	Mechanical Dentistry.
W. M. Garnett.....	Kentucky.....	Pericementitis.
E. A. Galbrath.....	Ohio.....	Dental Hygiene.
John McGarry.....	Ohio.....	Artificial Dentures.
A. N. Hauck.....	Pennsylvania.....	Filling Teeth and Materials Used.
R. L. Hyde.....	Ohio.....	General Inflammatory Action and Treatment.
A. W. Harlan.....	Illinois.....	Treatment of the Alveolar Abscess.
John H. Martindale.....	Minnesota.....	Dental Hygiene.
H. L. Millikin.....	Ohio.....	Oxygen.
W. S. Myers.....	Indiana.....	Continuous-Gum Work.
W. P. Merrill.....	Indiana.....	The Circulation of the Blood.
W. C. Nesbitt.....	Kentucky.....	The "New Departure."
S. W. Poland.....	Ohio.....	Conservative Treatment of the Dental Pulp.
Miss Annie Riley.....	Ohio.....	Development of the Teeth.
A. J. Richter.....	Wisconsin.....	Microscopy.
C. M. Richey.....	Indiana.....	Circulation of the Blood.
E. H. Steckman.....	Missouri.....	Inflammation.
C. H. Snyder.....	Ohio.....	The Fifth Nerve and Neuralgia.
S. S. Street.....	Ohio.....	Inflammation.
G. W. Sparrock.....	West Indies.....	The Dental Pulp.
C. T. Wiant.....	Ohio.....	Dental Hygiene.
B. W. Wikoff.....	Ohio.....	Preparing Cavities, Filling Teeth, and Materials Used.
Samuel Young.....	Tennessee.....	Filling Teeth and Materials Used.

BOSTON DENTAL COLLEGE.

THE twelfth annual commencement of the Boston Dental College was held at Memorial Hall, Wednesday evening, March 3, 1880.

An address was delivered by Rev. J. L. Withrow, D.D.; the valedictory by Lyman C. Bryan, D.D.S.

The number of matriculates for the session was sixty-five.

The degree of D.D.S. was conferred on the following graduates by the President, Professor I. J. Wetherbee :

NAME.	RESIDENCE.	THESIS.
George Taylor Baker.....	Massachusetts.....	Periodontitis.
William Barker.....	Rhode Island.....	Something about Medicines and their Uses in Dentistry.
Lyman Curtis Bryan.....	Massachusetts.....	Extraction of Teeth.
John Calder.....	British Columbia.....	Continuous-Gum Work from the Impression to the Completion.
James Harlow Daly.....	Massachusetts.....	Ether as an Anæsthetic, and the Methods of its Administration.
Henry Herbert Gage.....	Massachusetts.....	Anæsthetics.
Charles Haywood Haines.....	Maine.....	Treatment of Dental Caries.
Horace Dwight Hickok.....	Vermont.....	Development of the Teeth.
William Henry Hollis.....	Massachusetts.....	Abscess.
Walter Lamb, M.D.....	New Jersey.....	Anæsthetics.
Brunswick W. Leonard.....	New Brunswick.....	Extraction of Teeth.
Thomas M. Mitchell.....	Massachusetts.....	The Anatomy of the Human Teeth.
James Joseph Mulloy.....	Massachusetts.....	Atrophy.
Alvah T. Newhall.....	Massachusetts.....	Anæsthetics and their Use in Dentistry.
Hiram Edward Truell.....	Massachusetts.....	Anæsthetics.
Samuel L. Wellington.....	Vermont.....	Extracting Teeth.
Cassius E. Whinnery.....	Ohio.....	Dental Caries: Its Cause and Treatment.
Eben Moore Wilson.....	Vermont.....	Operative and Mechanical Dentistry.
Herbert A. Woodbury.....	Iowa.....	The Fifth Nerve.
Burton Charles Russell.....		Class of 1879.

The following persons have passed the Faculty, but have not yet completed their three years' pupilage :

Aaron Hill, Jr.....	Massachusetts.....	Anæsthetics.
Walter M. Lamkin.....	Massachusetts.....	Anæsthetics and their Administration.
James Edward Quinn.....	New Hampshire.....	Anæsthetics.
Warren N. Fairbanks.....	Massachusetts.....	Dentology.
Edward Payson George.....	Germany.....	Odontalgia and Odonto-Neuralgia.
John Edwin Graves.....	Massachusetts.....	Salivary Calculus.

INDIANA DENTAL COLLEGE.

THE first annual commencement of the Indiana Dental College was held in the Dental College Hall, Indianapolis, March 10, 1880.

The address to the graduates was delivered by Hon. Robert Van Valzah; the valedictory by R. W. Van Valzah, D.D.S.

The number of matriculates for the session was six.

The degree of D.D.S. was conferred on the following graduates by W. L. Heiskell, President of the Board of Trustees :

NAME.	RESIDENCE.
R. W. Van Valzah.....	Terre Haute, Indiana.
W. E. Swigert.....	New London, Missouri.
E. J. Church.....	Laporte, Indiana.

The honorary degree was conferred upon S. W. Dennis, M.D., San Francisco, California.

The thesis selected for the class by the Faculty was "Treatment of Children's Teeth, Deciduous and Permanent."

UNIVERSITY OF PENNSYLVANIA—DEPARTMENT OF DENTISTRY.

A PUBLIC commencement was held at the American Academy of Music, Philadelphia, March 15, 1880.

The annual address was delivered by Harrison Allen, M.D., Professor of Physiology.

The number of matriculates for the course of 1879-80 in the department of dentistry was seventy-seven.

The degree of D.D.S. was conferred on the following members of the graduating class by Charles J. Stillé, LL.D., Provost:

NAME.	RESIDENCE.	THESIS.
C. Alban Allen.....	Pennsylvania	Fundamental Principles.
William H. Bryan.....	Massachusetts.....	Dental Diagnosis.
Henry D. Croney.....	West Indies.....	Dental Nutrition.
George L. Curtis.....	Massachusetts.....	Affections of the Teeth as productive of Disease and Neuralgic Trouble.
Lewis C. Davenport.....	Iowa.....	Anæsthetics in Dental Operations.
Daniel F. Easton.....	New York.....	Preservation of Teeth.
Henry B. Hayden.....	Massachusetts.....	Suggestions to Young Practitioners.
George E. Hertz.....	Pennsylvania	Conservative Treatment of the Dental Pulp.
John P. Huntley.....	Georgia.....	Arsenic and its Dental Uses.
John A. Klump.....	Pennsylvania	Conservative Treatment of the Pulp.
Diego Lopez.....	Cuba.....	Periodontitis.
William G. Matthews.....	Pennsylvania	Periodontitis and Alveolar Abscess.
Henry Mora.....	France	Accidents Resulting from the Eruption of the Wisdom-Teeth.
Frank B. Morrison	Pennsylvania	Operative Dentistry.
J. N. P. Newton, L.D.S.....	England.....	Cleft and Perforate Palate and their Mechanical Treatment.
Hermann Nieriker.....	Switzerland.....	How Dentition is Injured by Rachitis.
Ramon H. Portuondo.....	Cuba.....	Replantation of Teeth.
Frank R. Rice.....	Massachusetts.....	Operative Dentistry.
Pratt J. Smith.....	Pennsylvania	Conservative Treatment of the Dental Pulp.
Edward C. Weston.....	Pennsylvania	Gold as a Filling Material.

DENTAL DEPARTMENT OF VANDERBILT UNIVERSITY.

THE Dental Department of Vanderbilt University held its first commencement exercises in the chapel of the University, Nashville, Tennessee, on Wednesday evening, February 25, 1880.

The address on the part of the Faculty was delivered by Professor D. R. Stubblefield; the valedictory by D. L. B. Blakemore, D.D.S.

The number of matriculates for the session was fifteen.

The degree of D.D.S. was conferred on the following members of the graduating class by the Dean, Dr. W. H. Morgan :

NAME.	RESIDENCE.	NAME.	RESIDENCE.
A. T. Kline.....	Tennessee.	T. E. Cabaniss.....	Tennessee.
D. L. B. Blakemore.....	Tennessee.	R. B. Lees, M.D.....	Tennessee.
J. H. Webber.....	Tennessee.		

UNIVERSITY OF TENNESSEE—DENTAL DEPARTMENT.

THE annual commencement of the Dental Department of the University of Tennessee took place at the Masonic Theatre, Nashville, on the evening of February 24, 1880.

The salutatory of W. L. Smith, D.D.S., whose absence was caused by illness, was read by Dr. John H. Moore. The valedictory was delivered by Dr. G. W. Morris, and the charge to the Dental Class by Professor Robert Russell.

The degree of D.D.S. was conferred upon the following graduates of the dental department by Thomas W. Humes, S.T.D., President of the University, assisted by Professor Duncan Eve, Dean of the Faculty :

NAME.	RESIDENCE.	NAME.	RESIDENCE.
Jas. C. Anderson, Jr....	Tennessee.	William L. Smith.....	Georgia.
Corydon W. Munson....	Tennessee.	E. S. Chisholm.....	Alabama.
Benjamin Garrett.....	North Carolina.	George T. Parker.....	Kentucky.
George A. McPeters.....	Tennessee.	W. H. P. Jones.....	Tennessee.
James W. Williams....	Georgia.	A. F. Mallett.....	North Carolina.
Byron B. Roberts.....	Tennessee.	J. J. Moore.....	Tennessee.
Joseph L. McGee.....	Tennessee.		

ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO.

THE twelfth annual examination of the Royal College of Dental Surgeons of Ontario, Canada, held in the city of Toronto, was completed on March 5, 1880.

The examinations being entirely written, no thesis is required.

Students in attendance on lectures, thirty-three.

The following gentlemen received license to practice dentistry and the title L.D.S. (Licentiate of Dental Surgery), viz. :

NAME.	RESIDENCE.	NAME.	RESIDENCE.
J. D. Schunck.....	Richmond Hill.	H. A. Parker.....	Gananoque.
H. A. Wilson.....	Wardsville.	P. C. Creeggan.....	Kingston.
John Mills.....	Brantford.	George Shephard.....	Collingwood.
J. H. Gordon.....	Elora.	W. E. Tunis.....	Hamilton.
H. B. Weagant.....	Cornwall.	J. G. Sutherland.....	Alliston.
E. P. Cornell.....	Berlin.	J. F. Taylor.....	Campbelford.
I. H. Farrington.....	Norwichville.	Allan Cameron, M.D.	Owen Sound.

EDITORIAL.

THE PROVINCE OF JOURNALISM.

THE careful and effective presentment of *facts* may be considered one of the best methods of conveying instruction. Next in value as a means of improvement may be classed an intelligent and orderly discussion of the deductions to be made from the facts, and the presentation of theories and modes of practice based thereon. But the observations and conclusions which are perfectly satisfactory to a writer, or even to the majority of his readers, may be entirely unsatisfactory to others. Hence arises another and scarcely less valuable source of improvement in the objections and strictures of doubters. The tendency of the human mind is to accept too readily the teachings of authority; the golden mean is often found between extremists. It is instructive to consider opposing theories, even though they seem preposterous; it is well to pass through the filter of criticism even ultra views and methods. Men who never take the pains to read the arguments of those who differ with them are apt to become not only intolerant, but actually oblivious to the force of objection, and therefore incapacitated to form correct judgments, by reason of the subjective's becoming stronger than the objective, so that "seeing, they see not, and hearing, they hear not."

A wrong theory is a torch which should light us in the search for the true. A perception and correction of the errors of others is one of the methods by which correct conclusions are arrived at. The effort to answer an opponent stimulates study and quickens the spirit of research. The true student is willing to receive with an impartial mind testimony at variance with his own observations, and ready to listen to deductions which seem to conflict with his own judgment. "The earnest questioning of received opinions," says Froude, "is the sign of vitality, the principle of advancement, the very source and root of healthy progress and growth,"—a remark which applies with special force to all scientific or professional pursuits. Observations, reflections, and conclusions eminently satisfactory to a writer may nevertheless be widely at variance with the truth. "He that is first in his own cause seemeth just, but his neighbor cometh and searcheth him." He who is unwilling to be searched by his neighbor is unfit to be a teacher. "If I have spoken any word of truth it will not die," said a famous theological debater; "but if I have spoken error it cannot survive, and I hope to attend its funeral." This is the true spirit of all real investigators, and if the idols which they have worshiped in their caves receive a corrective exposure in the healthy light of day they as well as others profit thereby.

We hold, therefore, that our readers are entitled to be informed of the opinions of earnest workers in the profession, however extravagant they may seem. For this reason we give place to communications of writers whose views differ not only with our own, but with those of the profession in general. Contributors are not restricted to utterances which accord with our convictions; but while we are not to be considered responsible for the views of others, or as indorsing all that we publish, we hold that our pages ought to be and must be open to the freest exchange of thought and opinion. We offer, therefore, to the thinkers and workers of the profession a channel through which may flow their varied contributions to the current of general knowledge.

DENTAL LEGISLATION IN LOUISIANA.

THE idea that the true remedy for the evils which have so long beset the reputable practice of dentistry is to be found in legislation, seems to be gaining ground, as witnessed by the passage of State laws for its regulation. The States having statutes on this subject are, New Hampshire, New York, New Jersey, Pennsylvania, Ohio, Indiana, North Carolina, South Carolina, Kentucky, Georgia, Alabama, and Louisiana. The full text of the Louisiana law, which has just been passed, is given below.

(An Act to Regulate the Practice of Dentistry in the State of Louisiana)

SECTION 1. *Be it enacted by the General Assembly of the State of Louisiana,* That from and after the passage of this act it shall be unlawful for any person to practice dentistry in the State of Louisiana unless said person has graduated and received a diploma from the faculty of a dental college, chartered under the authority of some one of the United States, or of some foreign government, or shall have obtained a certificate from a Board of Examining Dentists, duly authorized by this act to issue such certificates.

SEC. 2. *Be it further enacted, etc.,* That the Board of Examining Dentists shall consist of five dental graduates, practitioners of dentistry, who are members in good standing of the Louisiana State Dental Society, and have been practicing in the State of Louisiana for a term of not less than three years. Said board shall be elected by the State Dental Society to serve for two years. The president of the said Louisiana State Dental Society shall have power to fill all vacancies in said board for unexpired terms.

SEC. 3. *Be it further enacted, etc.,* That it shall be the duty of this board, *first*, to meet annually at the time of meeting of the Louisiana State Dental Society, or oftener at the call of any three members of the said board, and after thirty days' notice thereof; *secondly*, to grant a certificate to any applicant who shall furnish satisfactory evidence of having graduated or received a diploma from any incorporated dental college, without fee, charge, or examination; *thirdly*, to grant certificates to all other applicants who may undergo a satisfactory examination, also without fee or charge of any kind; *fourthly*, to keep a book in which shall be registered the names of all persons to whom such certificates shall be granted.

SEC. 4. *Be it further enacted, etc.*, That the book so kept shall be a book of record, and a transcript from it, certified to by the officer who has it in keeping, shall be evidence in any court of this State.

SEC. 5. *Be it further enacted, etc.*, That three members of said board shall constitute a quorum for the transaction of business; and should a quorum not be present on the day of meeting, those present may adjourn from day to day until a quorum be present.

SEC. 6. *Be it further enacted, etc.*, That two members of said board may grant a certificate to any applicant to practice until the next authorized meeting of the board, when they shall report the fact, and such temporary certificate shall expire, but *such temporary certificate* shall not be granted after the board shall have refused a certificate.

SEC. 7. *Be it further enacted, etc.*, That any person who shall, in violation of this act, pretending to be a regular practitioner of dentistry, practice dentistry in the State of Louisiana, shall be liable to indictment, and on conviction shall be fined not less than fifty dollars nor more than three hundred dollars: *provided*, that nothing in this act shall apply to regular physicians and surgeons.

SEC. 8. *Be it further enacted, etc.*, That one-half of all fines collected shall inure to the Louisiana State Dental Society, and the other half to the educational fund of the parish in which the offense was committed.

SEC. 9. *Be it further enacted, etc.*, That dentists who are in practice in this State at the time of the passage of this act shall be exempt from the provisions made in the first section thereof.

SEC. 10. *Be it further enacted, etc.*, That all laws and parts of laws in conflict with the provisions of this act be and the same are hereby repealed.

R. N. OGDEN,

Speaker of the House of Representatives.

S. D. McENERY,

Lieutenant-Governor and President of the Senate.

Approved March 10, 1880.

LOUIS A. WILTZ,

Governor of the State of Louisiana.

A true copy:

WILL. A. STRONG,

Secretary of State.

BIBLIOGRAPHICAL.

A TREATISE ON ORAL DEFORMITIES AS A BRANCH OF MECHANICAL SURGERY. By NORMAN W. KINGSLEY, M.D.S., D.D.S. Pp. 529. 357 Illustrations. New York: D. Appleton & Co.

Dr. Kingsley has been known for many years as an earnest and industrious student of oral deformities, and an ingenious mechanician in their treatment. He has here done good work in placing in a permanent and accessible shape the results of his extended labors.

The profession is to be congratulated on possessing so valuable an addition to its literature, and the author to be unstintedly praised for his successful issue to an arduous undertaking. Dr. Kingsley informs

us in his preface that the work was begun ten years since, and was ready for the press some time ago; that he deferred publication in order to make the whole more complete, but realizing the urgent necessity for a work of the kind as an embodiment of the latest knowledge upon the different subjects treated, he has concluded to publish it at this time. The work bears, in a word, every evidence of having been written leisurely and with care. It is divided into five parts, viz.: Irregularities of the Teeth, Palatine Defects, Maxillary Fractures, Mechanism of Speech, and the *Æsthetics* of Dentistry. It will be seen by this list that the term "oral deformity" is made to embrace a wide range of subjects. Deformity is perhaps not the best word to have selected in treating of a surgical subject, such as fracture, or a physiological one, as the mechanism of voice. The general surgeon will find much to interest him in both these last-named subjects, yet he might never be induced to look into a book carrying so deceptive a title as "oral deformities." The displacement of the fragments in a fracture is a mere incident, an incident which has not sufficient weight to cause this lesion to be classified among deformities. In like manner the mechanism of speech, although an important part of the knowledge essential to the correct application of artificial palates, is certainly no more cognate to the general subject of oral deformity than the mechanism of the cranial and facial bones to artificial dentures. Why should the former and not the latter be treated of in a work of this kind?

The chapter on the etiology of irregularity of the teeth is the most comprehensive of any we have seen. It embraces not only the author's views but those of all other veritable writers. Indeed, it is such a chapter as would serve as a model of an article in an encyclopedia of dentistry. We are glad to see the valuable paper by Mr. J. R. Mummery on the proportions of the dental arches in the different races quoted. The author definitely states that the position taken by some that dental irregularity is due to premature extraction of the deciduous teeth is false. The general underlying cause of irregularity is broadly given as the result of over-domestication; and the opinion is held that "the next generation will see more of abnormality in dental development, and an increase of nervous and cerebral diseases, and that the two are correlated and spring from the same cause."

On the subject of correlation between dental irregularity and idiocy, Dr. Kingsley is somewhat skeptical. His experience will harmonize with most writers that the V-shaped arch is often found in persons of more than ordinary intelligence, and that this peculiarly shaped jaw is absent in idiots. Nevertheless, he believes that in congenital idiocy it is found that as the scale is descended from the more tractable to the more intractable examples until we arrive at absolute

idiocy, the jaws and teeth, and in a measure the whole physical condition, degenerate. To employ the author's language: "All gradations are met with, beginning with a sluggish or feeble mind in a fair organization with well-developed jaws, descending thence in regular sequences though all the grades of imbecility to unconditional vacuity, associated with corresponding disorganization and degeneracy of the teeth, jaws, and the whole physical system." Certainly a figure of the upper jaw, on page 33, exhibits a state of development which would be unlikely to occur in any other than a congenital idiot. The striking peculiarity is here seen to be not the narrowed arch but the forms of the teeth. The molars resemble the bicuspsids, and a number of supernumerary teeth of a simple uncuspidate variety are seen on the left side.

The author wisely says that the "articulation of masticatory organs is of much more importance than their number, and a limited number of grinding-teeth fitting closely on occlusion will be of far greater benefit to the individual than a mouthful of teeth with the articulation disturbed." In another place (p. 114) he quotes approvingly Prof. Truman's statement, that "masticating surfaces striking directly upon each other produce serious irregularity." It is noticeable, that notwithstanding these two positive asseverations the author should say nothing in a methodic way of the normal occlusion of the teeth, and should mention the subject only incidentally, if at all, in the narration of his numerous cases. The author's method of obtaining the impression of the "bite" for comparative study, viz.: by using pieces of thick card-board cut about two and a half inches square, which are inserted in the mouth, the teeth closed, and a pencil line drawn around the circle close to the teeth (in this way the author informs us the size of the arch and its form are indicated), is suggestive that his mind turns to the importance of the subject of occlusion. But why not thus trace both the arches? And if the occlusion is so important, why should it not be continually emphasized? Dr. Kingsley's probable assumption that every practitioner may fill in such self-evident facts for himself will, we fear, be misplaced. Dr. Kingsley informs us, in his preface, that he has found it exceptional only for practitioners of his own State (in the course of a series of examinations before the New York State Board of Censors) to possess more than elementary knowledge of these and related subjects. It would have been better, we think, to have begun at the beginning and to have left nothing to assumption, or for ignorance to cavil at. We regret that want of space forbids us entering upon the important and attractive field of treatment of fracture of the jaw, more especially that of the lower jaw, and the study of obturators. Dr. Kingsley's labors have been identified with both these subjects,

particularly the last named. It is a noteworthy omission that no mention is made of the loss of the intermaxillæ apart from the subject of harelip. As is well known, these bones may be lost by necrosis in persons who have no congenital defects of either lip or palate; and in some such instances special modifications of the obturator or artificial denture are required before the false teeth can remain in position. While errors of omission may be here and there noted, the work as a whole is admirably done, and rather needs invitation to its numerous merits than criticism.

The illustrations are all excellent. The book presents a fine appearance, and is furnished with a full index.

OUR HOMES. By HENRY HARTSHORNE, M.D. No. IX. of American Health Primers. Philadelphia: Presley Blakiston, 1880.

A great writer has said that the sum of all civilization since the world begun is represented by the difference between the hut of a savage and a lady's parlor. In view of the dangers and pitfalls with which our so-called civilization surrounds and invades the lady's parlor, Dr. Hartshorne's little book—especially his statement that "we live too far from nature"—suggests the query whether the savage condition was not, after all, the safest.

But surely civilization ought not to be inconsistent with nature's laws; and this work explains very clearly and concisely how to apply the common sense of hygiene in the construction and use of houses and homes. It is notorious that what we call "common sense" is very uncommon on this subject. The chapters on ventilation and drainage are especially valuable, and ought to be studied by every housekeeper and builder. The author presents in one hundred and forty-eight pregnant pages the fruits of many years' observation, and the study of a whole library of works not easily accessible or intelligible to general readers. We regard the book as one of the very best of this valuable series.

OBITUARY.

MR. GEORGE W. RUTTERFORD.

DIED, in London, England, February 10, 1880, of heart disease, MR. GEORGE WILLIAM RUTTERFORD, in the fifty-second year of his age.

MR. RUTTERFORD has been long, widely, and favorably known to the dental profession of Europe as a dealer in dental goods, making a specialty of those of American manufacture. He was a courteous, kindly gentleman, of strict probity, and had won the confidence and affection of those with whom he was brought into business relations. He leaves a son, who will continue the business.

ACTION OF THE DENTAL PROFESSION WITH REFERENCE TO THE DEATH OF DR. SAMUEL S. WHITE.

MISSISSIPPI VALLEY ASSOCIATION OF DENTAL SURGEONS.

The committee appointed to draft resolutions on the death of Dr. S. S. White reported the following:

Your committee appointed to take into consideration the decease of Dr. Samuel S. White respectfully submit, that while death is common and we are often called to mourn, yet when an eminent man and loved friend is suddenly removed, we realize how difficult it is to express fully the sense of our loss. When the sad tidings of the death of our dear and honored friend, Dr. Samuel S. White, reached us, we felt that a great man had been called to a higher sphere. We knew he had gone abroad to rest awhile from the weariness and weakness induced by labor, largely rendered in behalf of the dental profession.

We remember the days and nights during his earlier years that he spent in his humble laboratory, mixing and compounding minerals and wresting from the oxides of metals the secrets of their colors in new relations, determined to bring forth from his muffle an artificial tooth more like the natural tooth than yet had been produced by the genius of man. We remember the bright young man, and how his manly face lit up with the glow of genius at the successive improvements his repeated experiments demonstrated. What a poor and mistaken estimate we would have of him if we should forget this love of the beautiful and exact in nature, that animated him to struggle with material things for all her delicate tints in the thousands of his experiments.

The results of his laborious devotion to produce that great want of his day in the dental profession, an improved artificial tooth, were crowned with success. He might have continued his dental practice, and doubtless would have attained eminence as a practitioner; but, notwithstanding experiments were costly and returns small, he persevered and secured for the usefulness and beauty of our race a ceramic tooth that has enabled skillful men to demonstrate that his and our noble profession is at once a beautiful science and a wonderful art. His knowledge of dental needs in every department suggested additional improvements, and by his own advances and his readiness to encourage others, he largely assisted in bringing before the profession many things that he deemed of use. At every gathering of the world's industries that has been held for almost thirty years, in the various nations of the earth, the juries of each in his special department have accorded to him the highest awards, thereby confirming the American verdict that he is of all our worthy and working compeers the man whom we most delight to honor, whose untimely death we most profoundly regret. His zeal and interest in dental education are well known.

This Association, being almost the oldest known, was often made the medium of his discoveries and improvements, and the OHIO DENTAL COLLEGE enlisted his liberality. His assistance, in taking several shares of stock, was rendered at a time when the struggles of its youth needed help: and we know that in his death, it, like other dental colleges, has lost a learned, liberal, and judicious friend. His generosity was as proverbial as his honesty; the truthfulness that beamed from his eye, and was ever on his tongue, was as pleasant as his presence was always gentle, manly, considerate, and kind. Such was largely the earthly side of our departed friend, and many of us who know of his thoughts and communings,

that rise above the common links of trade, realized that the divine side that manifested itself in honesty to his God, his love for man, produced a combination of excellences of character most worthy of our imitation. To his dear family we offer this honest tribute, in testimony of his sterling worth and our deep regret for the death of the beloved husband and dear father; and during their hours of poignant grief we affectionately tender them our deep sympathy in this their painful bereavement.

JAMES LESLIE,	} Committee.
J. TAFT,	
G. W. KEELY,	

Resolved, That a copy of the above be sent to the family and published in the dental journals.

The report from the committee was adopted by the Association on a unanimous rising vote.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

At the regular meeting of the Odontological Society of Pennsylvania, held January 3, 1880, the following resolution was passed unanimously:

Resolved, That this Society has heard with great regret of the death of Dr. S. S. White, and desires to record its testimony to his energy, probity, and perseverance in the development of aids to the art and science of dentistry, and to his character as a man and a citizen, and to convey to his bereaved family the assurance of its most sincere condolence.

AMBLER TEES, *Secretary*.

PERISCOPE.

THE EFFECT OF ANÆSTHETICS ON THE CIRCULATION.—The comparative effect on the circulation of intravenous injections of chloral, chloroform, and ether, has recently been studied by M. Arloing, and an account of his researches has been communicated to the Académie des Sciences. A solution of chloral was employed of the strength of 1 in 5, and a mixture of chloroform and ether with twenty volumes of water. Large animals (horses or dogs) were employed for the experiments. The needful dose was given in divided portions, and injected slowly into a vein far from the heart. Cardiographic tracings with the apparatus of MM. Chauveau and Marey show that the three substances do not all produce the same effects. All cause an acceleration of the cardiac pulsations, but this is more considerable, and occurs more promptly, with chloroform than with others. Chloral produces, first, a retardation. Both chloral and ether lower the pressure in the right ventricle, while chloroform increases it. Chloroform

and ether augment the force of the heart's contractions, while chloral lessens it. Hence it seems legitimate to conclude that the pulmonary circulation is quickened by chloral and ether, and is retarded by chloroform.

By means of a new hæmodromograph of M. Chauveau, the modifications in the pressure and in the rapidity of movement of the blood in the arteries have been recorded. Injections of chloral cause, first, a slight increase in the intra-arterial pressure, as well as in the quickness of the cardiac systole, and a diminution in the frequency of the heart's action, *i.e.*, an increase in the diastolic pause. Soon a fall in pressure and an increase in frequency result, and these continue as long as the anæsthesia. Chloroform often causes, at the outset, a slight dilatation of the vessels, soon replaced by a still stronger contraction, which makes itself evident in spite of the increase in the force of the cardiac systole. During the third period of chloroformization the vaso-constrictive action lessens, but does not give way to an opposite action,—at least, unless the dose of chloroform is poisonous. Ether affects the arterial circulation in the same way as chloral; in extreme etherization the accelerated pulsations present a marked dirotism; and there is a retrograde movement at each pulsation, as if the column of blood oscillates in the large arteries.

The venous pressure during chloralization is increased, and the tracing obtained may present arterial pulsation. With chloroform the venous pressure varies, just as does the arterial pressure. In etherization the two at first vary in the same manner, but later the venous pressure is increased, just as in the administration of chloral.

The conclusion from these facts is that the movement of blood in the capillaries lessens slightly at the commencement of chloralization and of etherization, and undergoes subsequently a considerable increase. The capillary flow first suffers a temporary augmentation by the influence of chloroform, and quickly lessens, to increase slowly at a later period, but without attaining always the normal rapidity.

Of the state of the cerebral circulation during the sleep of anæsthesia little is known. According to some observers there is at first hyperæmia, and, when sleep is well established, there is anæmia. According to others, even the profound sleep is accompanied by cerebral hyperæmia. The means of observation hitherto employed have been either insufficient or have been liable to error. The best method is to study the changes in the rate of movement of the blood in the artery which carries it to the brain, leaving the cranium intact, and to compare these changes with those in the pressure within the vessel and in the corresponding vein. Such an investigation shows, 1, that all anæsthetics do not produce the same effect on the capillary system, and that it is impossible to reason from one anæsthetic to the others; 2, that sleep from chloroform is accompanied by anæmia, sleep by chloral and ether by hyperæmia of the brain. Hence the conclusion seems to be inevitable that the modifications in the cerebral circulation are not essential to the anæsthetic sleep, and therefore cannot be regarded as its cause. It is probable, from a comparison of the results of ophthalmoscopic examinations with these observations, that the sleep induced by chloroform is that which presents the greatest analogy with natural sleep.—*The Lancet*.

ON THE PHYSIOLOGICAL FACTS IN REGARD TO ANÆSTHESIA.—M. Simonin believes (*Le Progrès Médical*, May 3, 1879), that of the various symptoms of etherization three appear to predominate. By means of these symptoms a diagnosis of the various degrees of etherization may be made, and by them the surgeon may be guided in the administration of an anæsthetic, and may obtain the full effect without risk of accident. The symptoms alluded to are, firstly, the manifestation of peripheral insensibility, markedly in the temples and cornea; secondly, the condition of the muscles of the lower jaw; thirdly, the state of the pupils, more especially in regard to their contraction, and to the relaxation of the iris. The conclusion of the author in regard to these points is, that when the peripheral insensibility sets in, the patient is in a fit state for the surgeon. The patient is in no danger so long as the jaws remain closed. Lastly, the contraction of the iris is a nearly constant symptom of the surgical period of etherization, and the maintenance of the contraction shows that the anæsthetized patient is not in any danger. But dilatation of the pupil should cause uneasiness, or at any rate should provoke the greatest attention on the part of the surgeon to the state of his patient.—*Cincinnati Lancet and Clinic*.

MUSCLES OF THE LIPS.—In the Report on Anatomy, published in September, 1877, we mentioned some observations on these muscles by Professor Henke. The gist of his paper consisted in so grouping the muscles that they presented essentially a regular diagram for both sides of the upper and lower lips. The triangulares were described as passing into the diagonally opposite quarter of the lips. Thus the fibers of the right inferior triangular muscle could be traced into the left half of the upper lip.

Professor Aeby* has recently added some interesting details to our knowledge of the subject. They are for the most part based on sections to be studied with a low magnifying power. The existence of a continuous circular muscle is denied. What we have known as the orbicularis oris is said to consist chiefly at least of the triangulares and the buccinator. The latter forms the body of what we must still call the orbicularis, and lies under the outer red portion of the lips. Flat sections show very beautifully a decussation of fibers from the two sides of the outer part of the orbicularis. Close to the free edge in the part just stated to be formed by the orbicularis this does not occur. A little further off the more superficial ones run into the skin in series of small bundles, crossing similar ones from the other side. At a greater distance no fibers continue in the lip, but all go to the skin. By far the greater number of these fibers cross the middle line. This arrangement is more clearly seen in the lower than in the upper lip. Aeby denies emphatically that the zygomaticus has any share in forming the orbicularis. It ends in the angle of the mouth. As it approaches this point it divides into two bundles. The smaller runs by the triangulares at their crossing-point into the skin; the latter, if we understand Aeby correctly, pierces these muscles, and runs into the mucous membrane. Aeby discusses also some fibers running between the skin and the mucous membrane, first described

* Archiv für mikroskopische Anatomie, Band xvi. Heft 4.

by Klein as the compressor labii.—*Thomas Dwight, M.D., in Boston Medical and Surgical Journal.*

TOOTH-GRINDING AND GOUT.—The connection between the habit of grinding the teeth and the gouty diathesis was pointed out by Dr. Graves, in the *Dublin Medical Journal*, as long ago as 1836, and explained by him as being due to an irritable condition of the dental nerves. The following account apparently illustrates this observation, and is in other particulars of some interest.

Eight children, the whole family of a father who has frequent attacks of acute and seemingly acquired gout, and of a mother whose grandmother and mother suffered severely from the same disease, grind their teeth almost incessantly at nights, and have done so all their lives. I am told by the mother that the conjoint noise made by several sleeping in one room is painfully audible outside the door. The eldest is twenty years old; the youngest ten months. All the children have cut their teeth at an early age, having generally two if not four teeth at three months. In several of these cases there is a notable degree of that wearing down of the teeth which was frequently observed by Graves. The mother, who, as I have said, comes of gouty parentage, though herself free, used to grind her teeth at night for many years. A further symptom that these children have in common with one another is the habit of sleep-walking and talking. The father was an habitual somnambulist as a young man, and still occasionally walks. Most of the children, I am told, are extremely nervous—"even painfully so." One, a youth aged eighteen, has suffered considerably from bleeding at the nose. This symptom has apparently not occurred in the other cases, but is worthy of note in this context, as Dr. Sutton has made the assertion, which is supported by Dr. Wilks in his exceedingly suggestive paper on Temperaments in the *Guy's Hospital Report* for 1868, that epistaxis and other forms of hemorrhage are common in children of the gouty diathesis. I would mention, lastly, that I am informed by my colleague, Mr. Cowell, that the two eldest have had corneal ulcers, such as are common in strumous children, in both eyes. The ulceration appeared first about the age of twelve or thirteen. There is no otherwise strumous history or fact noticeable in this family.

Some at least of these facts seem worthy of being recorded, as probably illustrating the symptomatology of gout, and as likely, therefore, to be of some help in the case of children towards diagnosis and precautionary treatment.—*Horatio Donkin, M.B. Oxon., in British Medical Journal.*

ON OSTEO-GINGIVITIS GANGRÆNOSA NEONATORUM.—Klementowsky describes under this name three very similar cases, the first he ever met with during twenty years' practice among children in the Foundling Hospital at Moscow. **CASE I.** A boy aged six days, well nourished, healthy, was taken ill, with high fever and an erysipelatous flush on the right cheek. The following day the latter had disappeared, but an oedematous dark swelling had appeared on the gums of the right upper jaw. Towards night two teeth broke through the swelling and fell out; the swelling diminished in size; ulceration set in four days later, and the child died. At the necropsy gangrene of the upper jaw and pyæmia were found. **CASE II.** A girl aged one

month and a half, badly nourished, had high temperature and a small gangrenous abscess on the gums of the upper jaw on the left side. On the second day a tooth broke through the abscess and fell out, the swelling diminished, the temperature rose, and a gangrenous abscess formed on the right side of the upper jaw. On the fourth day it began to heal; on the fifth peritonitis set in; and on the sixth the child died. The necropsy revealed purulent gingivitis, with ulcerations and diffuse purulent peritonitis. CASE III. A boy aged thirty-eight days, well nourished, had gastric catarrh a short time ago. There was high temperature, with a purple swelling of the size of a nut on the gums, corresponding to the right upper eye-tooth. On the second day a tooth pierced the tumor and fell out; it was replaced by a dentiform granulation surrounded by necrotic tissue. On the third day the swelling and granulation diminished and suppuration set in. The wound healed during the following days; but on the fourth the temperature again rose, and a hard reddish swelling appeared on the left side of the gums, corresponding to the upper molar teeth. No pus escaped on incision. During the following days necrosis set in, the swelling beginning from the edges of the incision, gradually exposing the tooth and the bone in the alveolus. There were fetid suppuration and a gangrenous perforating abscess of the left cheek. Death occurred on the forty-seventh day. At the necropsy it was found that the two posterior thirds of the left half of the upper jaw had become one gangrenous cavity, the periosteum was detached from the zygomatic bone, and the latter was necrotic.—*London Medical Record*.

A FORM OF "LAND SCURVY."—In the last (February) number of the New Orleans *Medical and Surgical Journal* a correspondent in Louisiana describes an affection which strongly resembles what is known in Germany as "land scurvy." He states that the part disordered is the gums, which are of a dark red, have a tendency to bleed easily, cleave from the teeth, making them look unnaturally long; the breath is disagreeable, and the patient does not seem to suffer much inconvenience from it, except at times, when the disease seems to be particularly increased. The patients drink, smoke, chew tobacco, etc., and eat as others do. There is no unusual salivation, but when they bleed it seems to be from a surface, not from any crack or fissure. The parties are not of syphilitic character. It goes locally under the name of "scurvy," and is very difficult to cure. He says he has never cured a case yet, although he has tried acids, neutral salts, astringents, locally, together with iodide of potash internally.

We have seen such cases occasionally in the Northern States, but have found them to yield readily to chlorate of potash and citric acid, with a varied diet and improved sanitary surroundings.—*Medical and Surgical Reporter*.

TRAUMATIC HERPES OF DENTAL ORIGIN.—M. David reported to the French Academy of Medicine three cases of traumatic herpes occurring upon the cheek and gums after operations or other dental lesions. The author proceeded to notice the extremely slight injury which in two of the cases produced the eruption. The pathogeny of this affection, whose history is not completely known, is of impor-

tance. In two of the cases a general malaise was experienced before the appearance of the herpes; there were also marked febrile indications, which clearly showed the general character of the affection. In two cases at least, then, M. David rejects the theory put forward by M. Verneuil, viz.: the calling into existence of a constitutional influence; he saw, in other words, only a simple case of febrile herpes. In the third case the eruption occurred several times upon the gums after inflammation of a portion of the mucous membrane above the wisdom-teeth, the inflammation being produced during the cutting of these teeth; that is to say, it was due to a particular complication caused by the cutting of the wisdom-teeth. The observation is interesting, as it explains to a certain extent the nature of the aphthæ, which some authors, apparently with reason, have called herpes of the mucous membrane. The conclusions which have been arrived at in regard to this subject are: (1) Some of the vesicular eruptions of traumatic origin may be regarded as the result and critical sign of the fever which preceded their appearance. This may be allowed while the initial cause is understood to be the wound itself. (2) A herpetic fever, as stated by M. Parrot, actually exists. (3) Wounds and the various operations performed upon the teeth, and in the mouth generally, may be considered sufficient to produce herpetic fever or herpes in the usual sense of the word.—*Le Progrès Médical, Cincinnati Lancet and Clinic.*

SIGNIFICANCE OF TENSION IN ABSCESSSES.—In a paper read before the Medico-Chirurgical Society of Edinburgh, Dr. A. James believed he had established (1) that while there is a relationship between the tension and the acuteness of the process, the tension varying directly with the acuteness, yet for various obvious reasons this relationship is not very well marked; (2) that the tension in small abscesses, etc., is greater than in large ones, though here also the relationship is not well marked; and (3) that there is a more definite connection between the tension and the composition of the fluid. The proportion of the mineral matter remained fairly constant, about seven per cent. Otherwise, the opposite of what they might expect holds; namely, that high tensions are associated with thick pus. The converse of this, too, holds, and it is found that a thin fluid is associated with low tension.—*Medical and Surgical Reporter.*

PATHOGENESIS AND ETIOLOGY OF RACHITIS.—Seemann (*Virchow's Archiv*) proved by an extended series of investigations of the urine in healthy and rachitic persons, that in the latter the excretion of lime salts is less than in the former, and that only during convalescence does the lime excretion again increase. A more extended examination into the infantile food, especially the milk of mothers having rachitic children, showed that in all these more lime is present than is required by the infant. Hence the poverty of rachitic bones in lime salts is due neither to an increased excretion of these salts from the body nor to their deficiency in the children's food.

In confirmation of the researches of Budge, he found that an excess of potash salts in the food leads to a poverty of the blood in chloride of sodium. His next object was to determine that the deficiency of lime salts in rachitic bones was dependent upon mal-nutrition, the foundation for which lay in a deficient formation of hydro-

chloric acid in the stomach. This caused a poverty of the blood in chlorides, and this, in its turn, depended upon a too abundant use of the potash salts (in vegetables and cow's milk).

He believes that in ordinary table salt, either in the form of baths or as an addition to food, we possess an agent that will positively prevent rachitis, and if not too far advanced, will even cure it.—*Berliner Klinische Wochenschrift*.

A NEW SYMPTOM OF IRRITATION OF THE FACIAL NERVE.—Dr. Leube describes the case of a woman aged sixty-two, who had been suffering from spasmodic tic douloureux for two or three months. It began with conjunctivitis, which was followed by blepharospasm; the spasm then spread over other branches of the facial nerve. The platysma myoides was the first muscle affected by the spasm, then followed the other muscles of the face. The spasms were so violent that the patient declared she felt as if her whole lower jaw were being torn away. At first there was profuse salivation, but this gradually decreased. The spasms were clonic bilateral, and extended to all the muscles supplied by the facial nerves, specially to the orbicularis palpebrarum and the platysma myoides. When the paroxysm reached its climax, the patient sometimes uttered a peculiar sibilant sound, which could be produced by drawing the soft palate upwards, at the same time contracting the uvula and performing expiration. It was therefore at once suspected that even while the spasm lasted the muscles of the palate were convulsively contracted. This supposition was verified by subsequent laryngoscopic examination during the spasm. If the tongue were slightly depressed it was easily seen that, when the paroxysm was very violent, the palate, which until then had been apparently in a rather relaxed condition, suddenly was contracted and drawn upwards, and the uvula, contracting also, almost disappeared. Dr. Leube, therefore, supposes that the sibilant sound as well as the spasmodic contraction of the palate was due to the part which those branches of the facial nerve that supply the palate took in the spasm. It was not possible to prove whether those fibers of the facial nerve which stimulate the secretion of the saliva were also excited. The treatment consisted in giving Fowler's arsenical solution, either internally or hypodermically, and the results were most gratifying.—*Aerzt. Intellig. Blatt*.

RELATIONS OF DISEASES OF THE EYE TO DENTAL IRRITATION.—It is a generally entertained opinion that dental irritation and diseased roots of teeth cause various diseases of the eyes; among others must be mentioned simple conjunctivitis; phlyctenular conjunctivitis—said to be due to dental irritation in children; amblyopia; and amaurosis. These diseases sometimes disappear after the diseased tooth has been extracted, or they may only be relieved. The pathological process which takes place in the optic nerve and retina during these dental diseases is not exactly known. In some cases nothing abnormal can be discovered in the retina with the ophthalmoscope; in other cases opacities are observable, and in others atrophy of the optic nerve.

Taking into consideration that diseased dental roots cause violent neuralgic attacks in various branches of the trigemini; that further-

more, severe neuralgia of the trigemini often causes intense lachrymation, conjunctival injection, and even, in some rare cases, considerable and long-continued swelling of the transition part of the conjunctiva, it is certainly not unjustifiable to suppose that the diseased dental roots may lead to changes in the retina, in the optic nerve, or in the cellular tissue of the orbit. At present, however, there is nothing ascertained on this subject with scientific exactness. —*Translation from the German of Professor Foerster, of Breslau, by Adolphe Barkan, M.D., in Pacific Medical and Surgical Journal.*

DENTAL EDUCATION IN GREAT BRITAIN.— . . . For some time past the great scheme of conducting one *thorough* examination as the test for medicine and surgery within one portal has been growing into popularity, and the signs of the times plainly indicate that such a system is about to become the law. Thus far since the year 1815 the object of the Legislature has been, and now is, to consolidate the different classes of medical practitioners and equalize medical education; and it is much to be lamented that the Dentists' Act should have been passed just at this crisis, as it is a strange contradiction of the whole scheme. . . . Unless some effectual step is *quickly* taken, dentists as a body will be isolated, and, I fear, compelled to found a college of their own. In that case, by the constitution of fellows and members some scheme might be arranged for the gradual separation of the surgical from the mechanical branch, thus imitating the old apothecaries by casting off the detrimental shop. It is to be regretted that out of five thousand two hundred and eighty-nine names which appear in the Dentists' Register only five hundred and thirty-three have given positive evidence of either a medical or dental education. If the Dentists' Act be allowed to remain unrepealed, what security is there that practitioners of other branches of surgery will not apply for and obtain a similar statute? If the Dentists' Act be repealed,—and I heartily hope it will be,—then, to prevent a repetition of the evil, it has been suggested that when the proposed Conjoint Examining Board is formed, a candidate should notify that, in addition to the ordinary examination of a medical practitioner, he desires to be examined particularly as to his proficiency in dental, aural, ocular, orthopædic, or any other branch of surgery, and if he shall show a thorough knowledge of any such branch, a certificate to that effect should be appended to his diploma, and he should be allowed to appear in the Medical Register as practicing that specialty. This certificate would not exclude him from general practice, because being fully qualified in every respect, he would be entitled to practice one or every branch. In any and every case those possessing the dental license should be encouraged to complete their surgical education, and for that purpose great facilities should be given to them during the next three years. They are the cream of the rising generation of dentists, their guiding stars of future hope! If a little learning is a dangerous thing, and if it be true of all professions that he who is only half educated can only be half trusted, then the dental licentiates will be most unwise if they remain in their present anomalous position. . . . —*Extract from Presidential Address of W. A. N. Catlin, F.R.C.S., at the Association of Surgeons Practicing Dental Surgery.*—*Medical Times and Gazette.*

HINTS AND QUERIES.

"He that questioneth much shall learn much."—BACON.

CORRESPONDENTS desiring a reply in this department are requested to make use of *distinctive signatures or initials*, and avoid the practice of signing their communications Reader, Subscriber, etc.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names. We cannot insert queries or replies except they are so accompanied. Names not necessarily for publication.

WILL some one please tell the cause or causes of the discoloration of children's teeth at margin of the gums, when in good health and from two years old up, and give treatment for same?—W. F. G.

WILL some one, through the DENTAL COSMOS, give the process of lining the inner edge of a plate with soft rubber?—W. D. S.

WILL some one please state the cause of rubber turning dark upon being vulcanized, and how to cause it to return to its original red color? I use the Bow-Spring according to directions, and heat up to 320°. Rapidly or slowly, the result is a dark plate.—"RUBBER."

REPLY TO D. D. S., who asks for some mode of preventing rubber from entering the joints. After the teeth are ground up, take the sections carefully off the wax, so as not to break more than is necessary, and on a plate of glass mix a little plaster a trifle thicker than water, dip the joints in it and replace them, and D. D. S. will not have any more vulcanite in the joints of his work.—C. W. DANFORTH.

REPLY TO D. D. S., in March number DENTAL COSMOS. The most certain way to accomplish this is to have your corundum wheel perfectly true, and make joints that rubber can't get through. If this cannot be done, use plaster of Paris or os-artificial to fill up the joints; or, when packing, use pink rubber opposite the joints, and if any should be forced through, it will not present such an unsightly appearance, as it is very nearly the color of the gum.—O. D. F.

ANSWER TO D. D. S.—If no one has a better plan to offer, I would give mine: that of mixing plaster of Paris in the hand very thin, and putting a small quantity over each joint before packing.—O. O. O.

ANSWER TO D. D. S.—My plan is rub a little *dry* plaster in the joints before packing, being sure to press it in with a small instrument.—M. J. L.

ANSWER TO "QUESTIONER."—Take a gold cylinder that will *fit* the pivot, insert it in root, fill around the margins with gold or oxychloride of zinc, *if necessary*; then saw open the pivot and press the ends apart, and while pressed together insert in cylinder, which should be filled at bottom with a little gold foil. Make the pivot as long and large as possible.—M. J. L.

ANSWER TO J.—My mode of capping exposed pulps is this: I first mix on glass, tolerably thin, oxide of zinc with carbolic acid only,—merely enough to cover the exposure,—and press to place with a pellet of cotton or spunk. I then mix the oxide with chloride, same way, and press to place over the first; trim and fill after hardening a little. My reason for adhering to the above plan is that I have not, to my knowledge, made a single failure since adopting it two or three years ago.—O. O. O.

ANSWER TO A. B. C.—My plan for securing a fit in the cases spoken of consists in slightly scraping or rubbing the rough part of the *impression* in front of

the air chamber, or scraping the *model* back of the air chamber, or both slightly.
—O. O. O.

REFERRING to the DENTAL COSMOS for March, we beg the privilege of answering a few queries contained therein.

In reply to "Questioner," who desires to know the *modus operandi* of attaching an artificial crown to a natural root, we would relate our own method, which is as follows: Taking the case where he has left off,—*i.e.*, everything ready for insertion into the root,—we first proceed to fill the root canal with gutta-percha pellets flush with the margin of the root. We then take the pivot-tooth, and with a penknife barb or roughen the surface of the pivot,—this is done to prevent its moving when imbedded in the gutta-percha; we now heat the point of the pivot over the flame of a spirit-lamp, and force it into the gutta-percha in the canal as far as it will go. After this we take a pair of flat-nosed pliers, and after heating the points quite hot, grasp the tooth and force it towards the apex of the root. In a short time the heat from the pliers will be communicated to the tooth, and thence to the pivot, and the whole will begin to move in the desired direction; when the pliers become cool reheat and repeat the operation until the tooth is in position. After removing the surplus gutta-percha from around the tooth, we cool the tooth with water and the operation is complete. We have not been as successful with oxychloride of zinc as with gutta-percha, and will therefore not touch upon that method.

We would recommend, for the benefit of "D. D. S.," that after opening the flask and removing the wax, he fill the joints first with dry plaster and then saturate with liquid silix, and allow it to stand as long as possible (overnight is preferable) before packing and vulcanizing. If he adopts this plan we are sure he will not be annoyed by imperfect joints.

For the information of your correspondent "J.," we would state that we have been most successful in capping exposed pulps in the following manner, *viz.*: Take of creasote and oil of cloves equal parts, and incorporate therewith enough oxide of zinc to make a syrupy paste; apply this paste immediately to the point of exposure, removing surplus moisture with bibulous paper, and fill the rest of the cavity with oxychloride of zinc. No irritation will ensue, and the patient can be discharged to await developments. If no subsequent trouble result in the course of two or three months, a sufficient quantity of the os-artificial can be removed to admit of a more permanent capping of gold or amalgam.

Our reasons for adopting this method to the exclusion of all others are, first, that it is non-irritating; and, second, that we have had the greatest number of successes attending its employment.—F. F. DREW, D.D.S.

EXTRACTING ROOTS.—Under this heading the process of drilling around roots, and thus facilitating their removal, is recommended by L. E. W. This method is taught at the Philadelphia Dental College, and is the one which I have used for many years. I *demonstrated it* in my "office clinic" during the Centennial Dental Association (1876); *wrote of it*, in place, when upon "difficult root extraction," in the January DENTAL COSMOS, 1877, page 6; and again *referred to it* when upon exostosed roots, in the March DENTAL COSMOS, 1878, page 135. I am pleased to see that L. E. W. approves the method.—J. FOSTER FLAGG.

A CASE IN PRACTICE.—The patient is my mother. In 1872 a leading operator of Rochester, New York, treated the first inferior molar on the left side, and filled the canals and crown cavity with gold. The tooth commenced troubling her soon after the operation, and the pain increased to such an extent that in

about two weeks it was decided to extract. The pain did not cease after the tooth was extracted, and was quite severe at times for about three months, after which it gave her no further trouble. About a year ago a small pimple appeared on the patient's face, just at the lower edge of the inferior maxillary bone, a little below where the end of the buccal root of the first molar would have come and just opposite that point. This continued to grow and show plainer on the surface until it was about the size of a pea. It was of a purple hue, and became quite sore. A week ago I noticed a little pus in the center of it and opened it, letting out two or three drops of pus. Probing it I struck something hard, which I picked out, and found to be a small piece of gold. It is of a conical form, and has the appearance of having been forced through the apical foramen, which had probably been enlarged. The patient has had no other teeth in that part of her mouth filled since 1872, and has had no filling at all done since 1873, and the tooth which I have described is the only one in which the canals were filled, so there is no doubt that the piece of gold has been eight years in making its appearance. The opening through which it came has entirely healed. There is a case of this kind reported in Harris's "Practice of Dentistry," but in that case it was a superior molar, where the alveolar process is not so thick, and the piece of gold came out nine months after the operation.—B. G. SIMMONS.

TOOTH EXTRACTION UNDER BROMIDE OF ETHYL.—I had the pleasure of extracting two teeth yesterday for a professor in the medical department of the University of Louisville, who, at his own request, was first placed under the anæsthetic effect of bromide of ethyl. He is a man of great activity of brain, and a difficult subject to anæsthetize. Repeated attempts have been made to etherize him, a pound or so of the drug having been consumed each time without satisfactory result. I state these facts as a possible reason for the effect produced by the bromide of ethyl upon this subject. The drug was thrice administered; twice the professor, a man of iron frame, hurled the attendants right and left, insisting upon explaining the effects of the drug, and recounting the singularly grotesque ideas it produced in his brain. The third time, despairing of getting him quiet, he was firmly held and we extracted the teeth. He declared that he experienced no pain in the operation, but was conscious that it was being performed. He recalls a feeling of indignation that three teeth were being removed—as he supposed—instead of two. The rallying of the patient was accompanied by slight nausea, which, however, soon passed away. My impressions of the drug are so far quite favorable. This morning I administered it twice with the happiest results. My first patient, a man aged forty, had two teeth extracted. The second case, a boy of fourteen, submitted to the removal of a sixth-year molar. No headache, no nausea, no pain in either case.—L. G. NOEL.

THIRD DENTITION.—The inclosed tooth, as you will observe, is a pretty fair-shaped cuspid. I extracted it for a little miss who was eight years old a few days after its removal. It was in the place of the upper right central incisor, and was erupted during the shedding of the temporary teeth. Her father brought her to have a tooth extracted which was coming above this one. On examination I found it to be the central incisor, showing nearly the whole of the front enamel. I extracted this one instead. When the incisor is in place it will be the third tooth which has occupied its position, and the child will be but little over eight years of age; otherwise her teeth are in their normal condition. If this is not a pretty lively case of teething, I would be pleased to hear from some one who has a case up to the times.—C. R. DWIGHT.

THE
DENTAL COSMOS.

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No. 5

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to Act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the office of the Librarian of Congress at Washington.]

(Continued from page 175.)

"SCARIFICATION" of the gums is an old-fashioned operation which has had, and indeed has now, many advocates.

It is probably better to take blood in this way than not to take it at all, but I think that this is the *most* that can be said for it. It is one of the most painful of all the ancient devices for giving relief to tender teeth, and, particularly when combined with a liberal application of tincture of iodine, is in my experience one of the least permanently beneficial.

By lancing the gums *as though for extraction*, the infliction is comparatively slight; the depletion may be made quite sufficient; there is no interference with bleeding by astringent or alcoholic applications; and there is no painful irritation during the process of healing.

The *second method* of depletion is by *leeching*. This very useful and very efficacious mode of depletion is still practiced to a very considerable extent, though the varied devices and more accurate medication of teeth are rendering its employment less necessary with every year's advance; nevertheless, leeches are so good a reliance in times of trouble that a few words concerning them cannot but be advantageous.

It is of *first* importance that the leeches be good, as this renders an application of a moderate number sufficiently depletive. *Second*, medicaments, especially capsicum, aconite, creasote, and iodine, should not be used upon the gums in cases where leeches are likely to be in-

dicated, as these prevent, in large degree, promptness of attachment and vigorous sucking by the leeches. *Third*, small incisions should be made in the gum with a sharp lancet, or preferably a curved bistoury. *Fourth*, a sweet application (solution of sugar in water) should be made to the cuts to aid the prompt "taking hold" of the leeches. *Fifth*, the leech should be presented to the cut, and retained in position until securely attached, by means of a leech-tube (a small test-tube answers admirably for this purpose). *Sixth*, a good-sized napkin should be so folded and arranged as to protect the patient from contact with the leeches, and these should be permitted to rest upon the napkin, after having become attached, by withdrawal of the tube; in this way the leeches may be consecutively applied, placing the most difficult of location first.

The application of one, two, or three good leeches is generally ample for obtaining all desirable depletion.

Seventh, leeches should *not* be applied *immediately over* the affected tooth, but preferably in immediate *proximity* to the inflamed gum-tissue. The reason for this is that the wounds of comparatively normal tissue heal more kindly than do those of inflamed parts.

The *third method* of depletion is by gum-cupping. This operation is performed by making a small incision in the gum and applying to it a *modified* breast-pump.

The modification consists in replacing the usual bell-shaped glass, which is the milk-receiver, with a properly adjusted tube of glass having a small mouth-shaped opening as its extremity. By gently pressing this against the gum, and slowly withdrawing the piston, the tube is filled with blood and the needed depletion of the parts is effected.

The cases in which this instrument is really needed are exceedingly rare, but like all such devices, appliances, medicaments, or materials, it fills its niche most beautifully *when the niche exists*.

In cases where leeches are decidedly indicated, and where antipathy to leeches is idiosyncratic, thus forbidding their employment except the patient be in a state of complete unconsciousness (anæsthetic or narcotic), gum-cupping is a most satisfactory means of attaining the end desired.

I believe that dentistry is indebted to Dr. J. D. Wingate, of Carbondale, Pennsylvania, for the suggestion of this ingenious and efficacious modification of depletive appliance.

When blood-letting is resorted to as a depletive in periodontitis, the hemorrhage should neither be restrained nor retarded (within reasonable limits), nor should it be stimulated or induced after it has in a measure ceased. The reason for this is, that a *sufficiency* of blood having been taken for the relief of the parts, that cessation

which is most natural will probably be best, and any interference with this result is meddlesome.

Should hemorrhage prove inordinate, which it is sometimes liable to do (especially from leech-bites), it is usually promptly controlled by *tinct. erigeron canadensis* or *tinct. chenopodium album* (not officinal, U. S.) in one or two drop doses every five or ten minutes, together with the local application of the same to the gums on compresses or pads of muslin.

In these cases of "third grade" the application of dental tincture of aconite freely to the gums *over the affected tooth and the adjoining teeth* will be found of great service; the mode of application has been given in connection with "local medication" of "second grade" periodontitis, and the only modification which I would now suggest is that of a freer and more extended medication, covering at least three teeth and possibly impinging upon the gum-tissue of five.

After having allowed the application of aconite to dry thoroughly, the "spotting" of the gum with dental tincture of iodine (six to eight times the strength of the officinal) is next in order.

The neat manipulation of the tincture of iodine, and especially of the *dental* tincture, is exceedingly difficult. With only usual care it not infrequently runs extensively over the gums, cheeks, tongue, and even lips; it also frequently soils the fingers of the operator, and is altogether defiant of control.

The tincture should be kept in a glass-stoppered bottle, as a cork is soon softened and destroyed.

In preparing for an iodine application, the stopper should first be loosened in the bottle; it is sometimes quite firmly adherent (as it requires to be pressed in very tightly to prevent evaporation of the tincture); *this* is therefore not always an easy matter. If it proves difficult it may be facilitated by dropping alcohol from a probe on to the neck of the bottle around the stopper. Some little time (five, ten, or fifteen minutes) may be required for the alcohol to so penetrate between the stopper and the bottle as to effect its loosening; this being done, a small pellet of cotton-wool should be either secured by twisting to the end of a probe, or taken by thumb-pliers, and the stopper having been iodined by tipping the bottle, it should be removed and the cotton pellet *moistened from the stopper*.

This insures a sufficiency of the medicament without *saturation* of the pellet, and permits an accurate "spotting" of the gums (which should be dry) over those portions which had previously been painted with the aconite.

It is ordinarily advisable to make from three to seven of these "spots,"—larger or smaller and more or less nearly together according to the irritability of the parts and the recuperative power of the

patient: larger places and fewer of them if *decided* impression is required and recuperation likely to be prompt, and smaller spots and more in number if the patient is nervously susceptible and recuperation is liable to be somewhat tardy.

The practice of painting large portions of gum surface is in all cases an unnecessary, and therefore unjustifiable infliction, not infrequently resulting in more discomfort and actual pain than it relieves; it denudes a large surface of its mucous membrane, results in an extended ulceration, and is inductive of long-continued annoyance during its healing; the process of "spotting" is accurate in its placing, *efficient*, circumscribed in its denudation and subsequent ulceration, tolerable in its infliction, and entails comparatively little annoyance during the healing.

Such accurate and varied meeting of indications would probably result promptly in marked alleviation of untoward symptoms.

Should this be so, it is still advisable in case of any doubt as to positively favorable prognosis that further antiphlogistic measures should be instituted, and for these we have to note the surprising efficacy of the *constant* use of cool mouth-washes. These should not be *too cool*, but just cool enough to keep the parts comfortable; if too cool the applications are liable to irritate other teeth, particularly if these be largely decayed and contain vital pulps, or if they be largely filled over living pulps, with fillings of high conductivity, or they may be more than antiphlogistic in that they are positively depressant.

This is not desirable; vitality should be restrained as nearly as possible within physiological bounds, and yet should be permitted the exercise of rather more than less of normal function.

The proper degree of temperature having been attained, it is a matter of the greatest possible moment that the applications should be made *constantly*. If this is not done, and intermission of application is permitted, a most injurious recurrence of irritation will be almost certain to take place.

This recurrence is most unfortunate for parts already enfeebled by recent previous disease, and predisposed to dangerous complications by systemic and temperamental concomitants.

A relapse occurs and hurries on to inflammation of high grade, returning to the practitioner a case of excessive irritation of periodontal membrane with an *open tooth*, and this *guarded from irritation by occlusion*,—two of the main reliances for relief,—and pain equal in degree with the original periodontitis to be combated.

It is unwise to permit the occurrence of relapse; the possibility should therefore be precluded by every means at our disposal.

Of all salts the *chlorate of potassium* in solution is the most highly beneficial of any which I have ever used; it seems to possess almost

specific action in subduing cases of acute oral inflammation, and possesses the double advantage of being susceptible of utilization both locally and systemically. For this reason it should, when used, be advised that it not only be employed as a collutorium, but that a teaspoonful of the solution be *swallowed* at least as frequently as once every hour or two.

The chlorate of potassium is rather an insoluble salt, requiring *sixteen* times its weight of cold water for its solution; therefore, the simplest form of mouth-wash is—

R.—Chlorate of potassium, $\mathfrak{z}\text{i}$;
Water, $\mathfrak{z}\text{ij}$.

Direct that to this be added a half-pint of water, and have it held in the mouth as constantly as is possible, and that a teaspoonful be taken every hour.

The biborate of sodium (borax) is also an excellent oral antiphlogistic; it is administered in the same manner as is chlorate of potassium. It is not quite so insoluble a salt, requiring but *twelve* times its weight of water for its solution.

It is generally more pleasant as a mouth-wash if combined with glycerin, and we have as an efficacious and agreeable prescription the following:

R.—Biborate of sodium, $\mathfrak{z}\text{i}$;
Water, $\mathfrak{f}\mathfrak{z}\text{iss}$;
Glycerin, $\mathfrak{f}\mathfrak{z}\text{ss}$.

S.—To this add a half-pint of water, and hold in the mouth as constantly as is possible.

It is well to order that a portion of this solution be swallowed occasionally for its beneficial effects systemically.

The fluid extract of hamamelis is another excellent application as a collutorium in acute periodontitis. I have found either Pond's or Humphrey's preparations to be the most satisfactory and reliable, and my patients have almost universally testified to the immediate benefit derived from their use.

Both the odor and the taste of this medicament are decidedly peculiar, and although to a majority of patients they are not very disagreeable, and to some they are very agreeable and eminently refreshing, they are yet, to a few, so excessively distasteful as to be even nauseating.

For this reason in rare instances we are debarred from utilizing this admirable remedy, but fortunately these exceptions are comparatively infrequent.

Like the solution of the salts which have been mentioned, the extract of hamamelis is diluted with several times its bulk of water,—

say *one* or *two fluidounces* of extract to a half-pint of water; this also possesses the quality of being beneficial both locally and systemically, and is therefore ordered to be taken in ten to twenty drop doses of the extract (in water) every hour or two hours as required.

It is sometimes advisable to combine an *astringent* with the cooling mouth-wash, and for this purpose the tincture of myrrh (if it be agreeable to the patient) or any one of the tinctures of *krameria*, (*rhatany*), *catechu*, or *kino* can be recommended.

R.—Chlorate of potassium, $\mathfrak{z}\mathfrak{i}$;
Tincture of myrrh, $\mathfrak{f}\mathfrak{z}\mathfrak{ss}$;
Water, $\mathfrak{f}\mathfrak{z}\mathfrak{ij}$.

This with the addition of the half-pint of water is used as a collutorium, but is not to be taken internally. If the systemic effect of the chlorate of potassium is desired, a saturated solution is made ($\mathfrak{z}\mathfrak{i}$ to $\mathfrak{z}\mathfrak{ij}$ water) and given in half-teaspoonful doses in water every hour or two.

Again, it may be desirable, as conditions assume a more favorable aspect, to add an agreeable, refreshing stimulant; for this purpose I know of nothing which more generally meets this indication than eau de cologne.

As it is an eminently dental idea that only the "best" is good enough, and as the Farina cologne is, perhaps deservedly, accorded the highest rank, I would say that almost any other cologne is preferable for the making of a mouth-wash. The reason for this is that *rosemary*, upon the peculiar admixing of which seems to depend much of the excellence of the "Farina," is quite strongly bitter to taste, and is soon, from repeated use, disagreeable rather than pleasantly stimulating and refreshing.

R.—Chlorate of potassium, $\mathfrak{z}\mathfrak{i}$;
Eau de cologne, $\mathfrak{f}\mathfrak{z}\mathfrak{ss}$;
Water, $\mathfrak{f}\mathfrak{z}\mathfrak{ij}$.

Half-pint of water to be added.

If the patient has decided preference for any particular flavor, as peppermint, wintergreen, anise, etc., the essential oil of one of these may be added in varying quantity,—say from twenty to forty drops; when this is done a sufficient quantity of absolute alcohol ($\mathfrak{f}\mathfrak{z}\mathfrak{ss}$) should be added to the prescription for the purpose of first "cutting" the oil in order that it may mix nicely with the water.

This latter suggestion of *especial flavor* should be *sparingly* indulged in, from the fact that *association with sickness or with suffering* is sometimes apt to *provoke antipathy*, and thus a flavor which has been largely enjoyable and which has thus given great and continued satisfaction is rendered distasteful from a comparatively prolonged gratification.

Besides the varied manipulations, guard applications, and oral medications which have been given, there are several suggestions in the direction of *tooth-medication* which, in peculiarly difficult cases, will be found of service.

As a rule these will apply to *lower* rather than to upper teeth, though there are occasional exceptions to this.

In some cases, even when the teeth are widely and completely open, and where every suggestion has received its due consideration, pain still continues to increase, or at most, does not abate. No canal cotons, however medicated, can be tolerated, the *gentlest* stopping of the external opening has proven to be inadmissible, and the admission of the fluids of the mouth seems to provoke irritation.

Under such circumstances, the careful absorption of the fluid within the tooth by means of *absorbent cotton* and its accurate replacement with *chloroform*, passing it gently into canals, if necessary, by a fine probe, and putting a small pellet of cotton, wet with the medicament, *very loosely* in the orifice of entrance, will, by several repetitions at intervals of ten or fifteen minutes, afford to some extent the desired mitigation of severity.

I have sometimes thought that the inhalation of the slowly evaporating chloroform might have its share—possibly a large one—in the giving of relief, and for this reason I advise its use only in extreme cases; but be this as it may, I have had, in such cases, some very comforting results from this practice.

The dental tincture of aconite used in the same manner is also a notable soother; this should always be used with the utmost caution (never in larger quantity than *two* or *three* drops), remembering that several drops—it may be five or six—can occasionally be received by the canals, pulp-cavity, and cavity of entrance of a lower molar, and that *each drop is equal to an ordinary systemic dose* of officinal tincture of aconite root.

This application should be covered by the same method of *loose pelleting* as directed for the chloroform, the pellets being slightly moistened with oil of cloves to prevent absorption of the aconite.

The application of aconite does not require nearly so frequent renewal as the chloroform because of its being so very much less volatile, but it is well, if convenient, to make one application as early in the day as possible and another as late as may be, in order that fresh sedative may be provided for the night.

In some cases, particularly of large canals, the introduction first of a portion of acetate of morphia paste from the end of a small probe is advantageous; this is softened to a creamy consistence by the tincture of aconite, and the two exercise a combined influence for good.

And yet another is the application of *nitrate of potassium* (saltpetre), which from its remarkably cooling influence *while dissolving* is utilized by being *finely pulverized* and packed into the *not too scrupulously dried* pulp-cavity.

When this material is used the cotton pellets stopping the external orifice should be *dry*, and it is remarkable that moderately tight closure will be tolerated even at first, and accurately tight stopping with tolerable promptness.

It is usual—no matter how tightly stopped the orifice—to find the saltpetre completely dissolved and the cavity comparatively empty in the course of a few hours,—eight or ten,—or at most in a day.

Concomitant with this *gradual solution* is maintained the *constantly continued cooling influence* upon the surrounding parts, and to this is naturally ascribed the beneficial effects, when such result from this medication.

(To be continued.)

DENTAL EDUCATION AS A SCIENCE.

BY A. H. THOMPSON, D.D.S., TOPEKA, KANSAS.

(Continued from page 180.)

A PROFESSIONAL education is a superadded training,—an extra, special culture,—ingrafted upon the basis of a general education, after such “an equable evolution of the human powers” (Bain). General education avoids all one-sided development of the powers, and properly devotes itself to the symmetrical evolution of the mental faculties. It is, indeed, merely preliminary to after-training. Its purpose is to give shape and direction to crude force. It seizes the vigors of the mind and directs them into the channels best fitted for their healthful and symmetrical development. From crudity and uncouthness it brings forth culture and beauty. Its utility consists in the preparation of the mind and the natural powers for the proper reception and utilization of that technical education which forms the substance of all occupations in which men engage as affording a means of livelihood and increasing their chances for living in the struggle for existence. For this, after all, is the object and aim of education; and living as we do in the era of mind, when physical force is subordinated to mental power, when the man of mind overcomes the man of physical strength in every contest, merely because of his superior knowledge and his developed faculties, it becomes us to equip those whose preparation for the struggle for existence devolves upon us, in the best possible manner. To this end we pronounce a good general education indispensable to success. The primary devel-

opment of the powers must be first and well attended to. We must see to it that those whom we wish to train to carry forward our work and to succeed us in the service of humanity, are well educated in a general way, and well prepared to receive the technical education and training which we shall administer. The sooner we recognize and act upon this inviolable law,—that a sound special education can only be founded upon a sound general education,—the better for our efforts, and the sooner we shall succeed in raising up worthy and capable men.

To this end we must demand that none but graduates of reputable literary institutions shall be allowed to matriculate and enter upon our special studies. This would at once largely decrease the amount of disreputable material issuing from our colleges into our ranks, with the certificates of ability in their unworthy hands. Very few of the graduates are well educated, and still fewer possess the indispensable M.A., without which applicants should not be admitted. There is no call for, no need of compromising the issue with ignorance or mediocrity. There will still be enough, and to spare, of men of sound attainments to enter our ranks to keep up the supply of practitioners. No one fears such a result as the decrease of this supply. If we concede to ignorance at all, greater and greater demands will be made and granted continually; the standard will sink lower and lower as ignorance with money in its hands makes its exactions.

The time has fully come when "*we must educate or die!*" Compromise is suicide; half-education is ruin; safety is found alone in complete knowledge. These truths are as applicable to us as a profession as they are to us as a nation. Half-knowledge will ruin us, nationally and professionally, unless we strike, and strike hard, for higher education. Mediocrity and superficiality in high places, filling offices of trust where wisdom should sit enthroned and honored, where all human knowledge and experience should be stored for all occasions of need, are causing us to drift slowly but surely toward that utter incapacity which will finally wreck us. One of the curses of republican institutions is the contingency of the occasional ignorance of rulers. There is no such thing as *liberty* from the tyranny of knowledge. It is as exacting as it is powerful. There is no easy royal road leading to it. It must be gained by simple hard labor, and he who hopes to escape this labor and compensate for the absence of knowledge by cunning or other devices will fail utterly. Knowledge has no substitute.

We insist, then, that we must first of all select the material of which to make students, and impartially and unceremoniously reject that which is raw and uncultivated. We must choose those minds already opened and sensitized by literary culture, fertile and susceptible, and

upon them ingraft the scientific principles and technical training of our professional education. We must have the full-grown intellect, prepared for the mature labors of professional study, to work upon. The childish minds of the illiterate must be rejected *in toto*, regardless of feeling for individuals, but in deference to love for the profession. It does not matter how "hard" it would be on "self-made" and "self-educated" men, the "struggling poor young man," and the rest. If they even are *men*, they will not demand the degree unless they deserve it, and if they do not deserve it we must not give it to them. Educated men alone furnish promising and encouraging material. Something can be expected and demanded of them. They can be led understandingly from one stage of knowledge to another, finely-drawn deductions and theories can be carried home to them, and the beauties and depths of all human science can be laid open with the hope of their being understood and appreciated. There would be no "casting of pearls before swine," no lowering and laborious elucidation of the simple things of science, and no hopeless explanation of the complex things. It would be bringing knowledge to its own. There would be no waste. It would be giving food to those who could digest and assimilate it. It would be furnishing the capital to those who could usefully employ it, and be making useful men of those who were capable of this highest honor of being of service to humanity.

The defenders of the college system may say that if the right kind of material were furnished the colleges, they could turn out better results; that if practitioners would examine candidates and take care in the selection of students, and not let the mere office drudge develop into a matriculate, the resulting graduate would be more worthy of the title. The point is well taken, but the fault lies with the colleges themselves. If the standard of admission were not merely *nil*, such material would not enter the colleges and would not apply. If the colleges would discriminate, the practitioners would also discriminate and be compelled to avoid the intellectual paupers who wish to "learn dentistry" because it "is easy." There is little or no demand for the endeavor, made so energetically and so vainly by the colleges, to work up the raw youths, whose minds are strangers to the merest rudiments of knowledge, into respectable practitioners. The material is received indiscriminately, and graduated with little more discrimination. It is preposterous to imagine that such minds can appreciate or understand, much less master and apply the scientific principles underlying our education, or grasp the necessary technicalities. It is contrary to all reason and experience. Why, then, ask it? It would take nothing short of a miracle to make a scientific man out of the student ignorant of the most common elements of

knowledge, and yet this is what the colleges are continually attempting, with the result that might be expected. Much time is wasted upon the simple things, which properly prepared minds could at once receive and advance to the higher things of scientific knowledge, which the crude minds never reach.

It is a painful fact, also, that the literature of dental education of the past few years has nearly all been devoted, either directly or indirectly, to the lowering or "arranging" of the curriculum in order to enable the average student to get through it easier or quicker or cheaper, and to "lopping off" all superfluous things to the end of making it more "practical." There have been "theories and theories," all tending more or less toward the "simplification" of knowledge, and the idea of getting it in some way or other into the student without unnecessary expenditure of time, money, or labor.

But the spirit of the times thunders in our ears that these things are obsolete; that we must be up and doing and strike for higher and better things; that the follies, the trifling of the past must be abandoned; and that we must keep abreast of the progress of the age in the duty of education, *or we fail*.

The demands of the new era, the exactions of duty, the spirit of true progress, the central idea of a perfect system, are expressed and contained in one pregnant word,—*thoroughness!* *This* must be the watchword, the rallying-cry, the central principle of the new education. It must be the keystone of the new system: it must be engraved upon the seal and be the motto of the new institution. In this principle alone dwell the light and the hope of the future. Outside of it are the darkness and uncertainty of the present. In it there is neither danger nor the possibility of failure. Outside of it is neither true success nor the possibility of honor.

Let us, then, have done with mediocrity, superficial education, and incapable operators; let us educate in the truest sense of the word; let us compel the matriculate to "begin at the beginning" and ground his education upon the foundation principles; let us give him a strong, simple culture, strong with the strength of knowledge, simple with the simplicity of wisdom. Not with the weakness of the schools,—a smattering of anatomy, physiology, and chemistry, with some industrial and technical education superadded,—but with a thorough knowledge of all implicated sciences, experimental as well as theoretical, until he shall, in fact and in deed, possess that thorough grounding in principles that he shall *know why* certain things are so or are not so, why certain things are done or are not done, when he comes to special instruction in practice. His education must also be manipulative and manual. His hands and his eyes must be trained as well as his mind. He must learn to *do* as well as to know. He must be able to apply

and practice successfully the knowledge he has obtained, for this is the end of knowledge. His knowledge must be made useful to him or it is superfluous. He must be scientific at the first but practical at the last. He must begin with knowledge and end with work.

In the duty of the application of the principle of thoroughness, lies our responsibility to those intrusted to our care for preparation for the struggle for existence,—the earning of a livelihood. It is a mistaken kindness and the assumption of a fearful responsibility to let the incompetent man graduate; to be “easy” on him in order to get him “through,” persuading him that he is prepared for the practice of a profession for which he is, perhaps, totally unfit in every way, by nature as well as by education. In time he will reap only disappointment and failure; his will be unrewarded efforts, imperfect endeavors, failure to secure competence, a miserable life, a premature death, a family left in poverty and penury. Whose is the fault? Who is responsible for this wrong? It is better to reject them at the start, that they may earn good livings in callings better suited to their capacity, than that they should be induced to attempt an occupation they are first naturally unfitted for and are then not half educated for. It is better to be a good mechanic than an indifferent dentist. The lowering of the standard to the capacity of such a man does a double injury,—*i.e.*, to the man himself, and to those he serves with the pretense to an ability he does not possess.

The need of thorough education to the average practitioners of our day is a self-evident fact. One of the most striking instances of this, and of the necessity of thorough grounding in the principles underlying our work, was in the discussions which took place upon the “new departure” theory. Occasions frequently arise in which a recurrence to and knowledge of basal principles is an absolute necessity to the understanding of the situation and the intelligent and wise decision of important questions. Then, again, there are the more frequent occasions in every-day practice and the discussion of every-day things intelligently when the practitioner can neither work nor talk, without a knowledge of basal principles. How we have been pained in every society meeting by the utterances which betrayed an utter lack of knowledge upon the most common scientific principles, or have seen operations performed with a complete disregard of the natural laws involved! The knowledge of rudiments, or of the simplest principles requisite for any intelligent effort at practice, is a rare thing among us, and when one does appear who can begin at the *a b c* of our learning in the elucidation of a theory or method of practice, he is looked upon as a Gamaliel. But that this simple knowledge should be in the possession of every one of us, no one will deny. In the hurry of our educational system the

rudiments are ignored and the student is led at once into the higher paths, where he is utterly incapable of walking. He gets a smattering of many and deep things, but he does not know any one thing well.

We insist, then, that thorough grounding in the sciences and principles involved in our work, is the first grand requirement in making the advance toward a higher education. Let the student be grounded in principles first of all, and even if he should not reach details, he will be better fitted to practice than under the present system of giving him a little miscellaneous information on the higher things and leaving the basal principles of such knowledge untouched. The thorough knowledge of principles must precede all else. It must be learned step by step, and thoroughly learned. Anything but this is mere sham. If the student cannot or will not master the simple principles he had better stop right there, for he can never succeed without such knowledge. There is no necessity for compromising knowledge with him. Half-knowledge will be an eternal curse to him, his profession, and his patients.

(To be continued.)

CLINICAL REPORTS.

PHILADELPHIA DENTAL COLLEGE.

CLINIC OF ORAL SURGERY. SERVICE OF PROF. J. E. GARRETSON.

THE case before the class is a rare one. The patient, as is seen, is a gentleman well advanced in years. His age is seventy-six. For twenty years he has been a sufferer from neuralgia of the facial region; not ordinary neuralgia, but suffering so severe and unendurable that these many years he has been a wanderer up and down the earth seeking relief.

You see a great scar upon the face. That scar was made by the knife of the famous Parisian surgeon, Velpeau. The meaning of it is section of the superior maxillary division of the fifth nerve. The result of the operation was *nil*. Besides the surgeon of La Charité, consultations have been had with almost every medical man of renown in the principal cities of Europe. From these consultations the gentleman has come away nothing better.

You will remark that the teeth have been lost, every one of them. Different doctors removed them, one after another, in treatment of the case. When I repeat what the patient has told me, "that the organs were without blemish, no decay in any of them; that not the slightest relief was afforded by the extraction," you will appreciate the evil lying at somebody's door.

Excessive and continued pain has pretty well exhausted the patient. Here, indeed, is a case which Anstie would undoubtedly incline to put forward as illustrative of his favorite theory of "exhaustion the cause of neuralgia." Anstie's theory is held in no favor at this clinic. The cause of nerve-pain is expressed in the word *irritation*. The irritant is almost universally of a strictly local character. The exhaustion in the case before us is consequent to the pain, not the pain to the exhaustion.

To cure neuralgia is to discover the lesion on which it depends and to remove it. Many neuralgias are incurable because the lesions are irremovable. The lesion of the case before us has been diagnosed by no surgeon who has preceded us. No treatment pursued could by any possibility have amounted to anything; save indeed by accident.

If there is any individual thing I exert myself to impress at this clinic, it is that effect arises out of cause. He who has not discovered cause has no remedy for effect. To do nothing unless you know what to do is a practice that will be pursued by every judicious practitioner.

Can we diagnose the case before us? I have diagnosed it. For a whole month I have been working at the matter, and to-day I am willing to risk in your presence an operation, which if it result in failure justly exposes me to censure from you. When, young gentlemen, you recall the admissions I am constantly compelled to make of entire inability to discover the cause of many cases of neuralgia coming to this clinic, you will think I have good and sufficient reasons for the confidence entertained in the present instance.

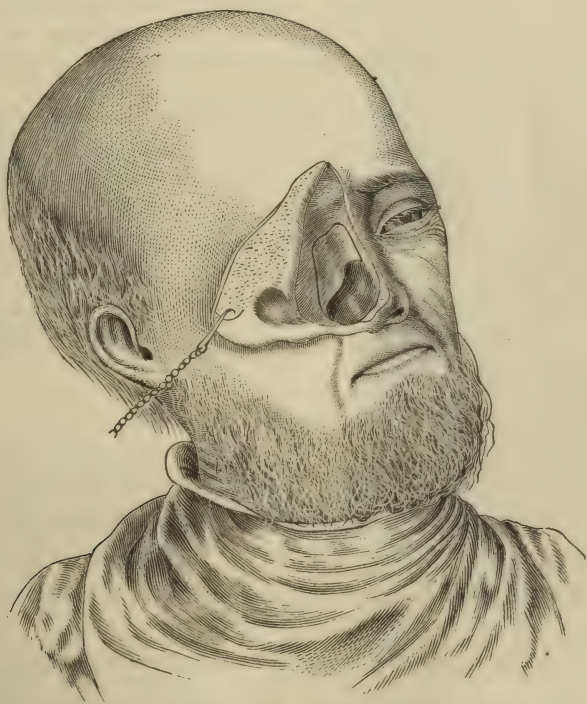
Come with me now over the steps of the inference. The pain, touch what part it may, starts always about the naso-maxillary articulation of the left side. Observe that at this point there is irregularity; the nose seems somewhat twisted. Twenty-two years ago, two years before the commencement of these neuralgic attacks, the patient met with an accident to this region. The trouble passed quickly away, however, and no thought has been given the matter since. Certainly no thought about any connection of the accident with his present trouble seems ever to have entered the mind of our patient.

I now hold before you, and direct attention to, an elaborate dissection of the fifth nerve. I call your sight to a little foramen in the nasal bone, out of which is seen to emerge a nerve-filament, which filament forms a loop with another coming from the orbit. My inference is this: Change in the parts, resulting from the accident alluded to, interferes in some way with the function of this filament. Not unlikely there exists a constriction at the foramen. The latter is the prominent idea in my mind.

If the diagnosis be right, cure lies in removal of the offending part. The operation proposed is ablation of all bone involved in the twist.

I now proceed to do such operation. To produce complete and prolonged anæsthesia in one so old and weak as this patient is not without danger. The task will be given to my experienced clinical assistant. There is a lesson to you, young gentlemen, in noting the care exercised.

. . . Our patient being now etherized, I commence by dividing the nose at the median line, inclining the blade of the knife obliquely to the left so as to avoid the septum narium. I now with care dissect the flap from the nasal bone and nasal process of the maxilla. This being done leaves us, as you see, perfect exposure of the parts proposed to be removed—shown by the cut.



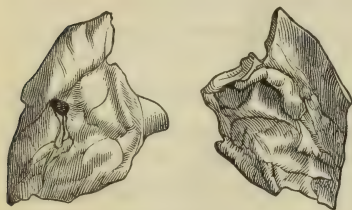
The next step employs the saw. Witness, gentlemen, the delicacy of the bone operation as permitted by the use of a circular saw, revolved by the engine. It impresses you all. I do not wonder. It impresses me most of all. I do not know what now I should do without this circular saw; you know nothing about the crudity of the old saws.

The irregular circle is now completed, and it only remains to dissect the piece cut away from the attached soft parts below. A single

moment and you will see whether I have made a truly great hit, or whether, like my predecessors in the case, I have bungled.

* * * * *

Look at this bone, gentlemen (see cut drawn from the section).



The nerve alluded to does not come out of the foramen, but has its situation at the suture. The twist pointed out had its meaning in injury done to the articulation. The nerve is pinched, caught apparently, between the misplaced bones. I call particular attention to this bulbous expansion

seated at the point of entrance into the bone on the under-side. We may pronounce this a neuroma. This neuroma is the lesion.

Gentlemen, as in your future you may have occasion to work at the diagnosis of the neuralgias, hold in mind remembrance of this case.

[The patient continuing for a considerable time under the anæsthetic impression, Dr. Garretson improved the occasion by reference to peculiar cases of neuralgia treated from time to time by him. One of particular interest was that of a lady driven almost into a condition of mania by persistent pain seated in the intra-maxillary canal, which pain was cured only after the discovery by him and treatment of an ulcer situated on the inside of the uterus. The patient operated upon as above described was a private patient of Dr. Garretson's from the West Indies.]

PROCEEDINGS OF DENTAL SOCIETIES.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE regular meeting of the society was held on Saturday evening, February 7, at the residence of Dr. Daniel Neall, 1627 Summer Street, Philadelphia.

Dr. Marshall H. Webb made the following remarks on

LIVING MATTER THROUGHOUT THE DENTAL AND OTHER TISSUES.

The illustrations* shown, and the remarks to be offered in relation to them this evening, refer mainly to some of the investigations and discoveries made during the past few years by Prof. Carl Heitzmann and Dr. C. F. W. Bödecker, of New York City.

The subject is interesting and instructive, as the more perfect our

* The drawings for the cuts to illustrate these remarks were made by Dr. Bödecker from the specimens he prepared.—M. H. W.

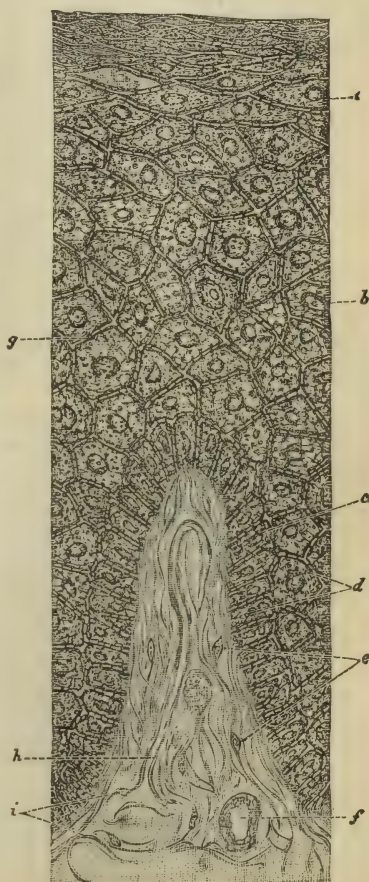
knowledge of the living matter throughout the tissues the better qualified we are to make fine discriminations in reference to deviations from normal action, and the more fully prepared we become for the prevention, treatment, and cure of diseased tissue and the restoration of organs to their original type.

Max Schultze was the first to describe the delicate "thorns" which pierce the cement-substance between epithelial bodies and connect one such body with another (Fig. 1, *d*). These lines which Max Schultze termed thorns were described by him in 1864.

Carl Heitzmann discovered the minute structure of protoplasm and that of the various tissues of the animal body in 1873, and about the same time found that Max Schultze's thorns are fibers of living matter, and that they are continuous with the reticulum of living matter in the epithelial bodies themselves (*g*, Fig. 1); he also attributes the movement of the cilia of the ciliated epithelium to the constant action of this same living matter throughout the epithelial body. The cement-substance in all epithelial and endothelial formations is pierced by fibers of living matter.

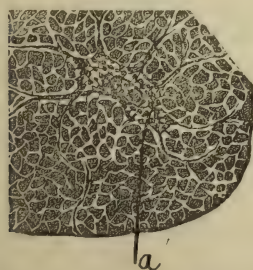
Dr. Heitzmann describes the net-like structure of protoplasm thus: "The nucleolus is connected with

FIG. 1.



Part of papilla of the gum near a tooth, magnified 350 diameters; *a*, flat epithelia; *b*, cuboidal epithelium; *c*, columnar epithelium; *d*, Max Schultze's thorns; *e*, connective-tissue corpuscles; *f*, small vein; *g*, reticulum of living matter; *h*, capillary; *i*, connective-tissue bundles.

FIG. 2.



the wall of the nucleus, and this again with the granules of the protoplasm by very fine threads, which are to be regarded as the living

matter of the protoplasm, while the fluid contained within these meshes of living matter does not possess the property of life" (see Fig. 2, *a*, a protoplasmic body of the cementum, magnified 1200 diameters).

It is questioned whether the fluid within the meshes or reticulum of living matter is really lifeless. The main properties of living matter are motion (the swelling of the granules at the points of intersection of the reticulated structure), the capacity to produce its own kind (in inflammation and reproduction), and the violet staining it receives from a half per cent. solution of chloride of gold. Each atom of the basis-substance within the net-like arrangement of the fibers of protoplasm surely possesses what is termed affinity (and may have several degrees of affinity), and one atom under certain influences becomes connected with another to form a molecule, and so on, in the manner several times stated by Dr. Atkinson, till granules and bodies are formed. Is this not life?

Soon after his discovery of the net-like structure of protoplasm, Dr. Heitzmann observed that the living matter, in the form of a reticulum, was present in the three varieties of connective tissue, viz.: myxomatous, fibrous, and cartilaginous. In Fig. 3 are shown three

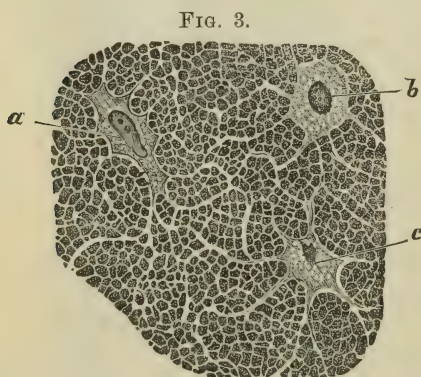


FIG. 3.
Cross-section from compact bone of lower jaw of a man about thirty years of age, magnified 1000 diameters; *a*, *b*, and *c*, protoplasmic bodies or bone-corpuscles.

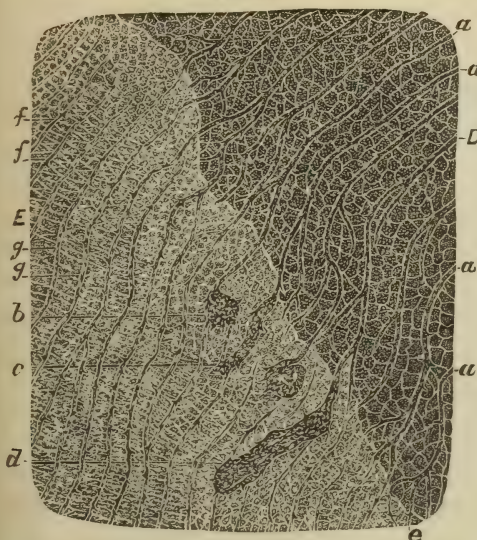
protoplasmic bodies (*a*, *b*, *c*); from the offshoots of these fibers of living matter are distributed through the light reticulum of the basis-substance of the bone.

Dr. Bödecker extended Prof. Heitzmann's discoveries to bone and other tissues, cementum, dentine, and enamel, and is now studying the pulp. He found in fresh specimens (magnified 1200 diameters) that fibers of living matter from the "odontoblasts" along the periphery of the pulp during the formation

of the tooth, and the protoplasmic bodies of the same when the organ is fully formed, not only enter the dentinal canaliculi, but extend beyond the boundary-line between the dentine and enamel (Fig. 4, *g*) as well as into the cementum (Fig. 9, *b*). In tracing the fibers of living matter through the dentinal canaliculi and across the line of union of the dentine and enamel, Dr. Bödecker found delicate fibers extending between the columns of the so-called enamel prisms (Fig. 4, *g*). He also observed that the fibers do not quite fill the canaliculi,

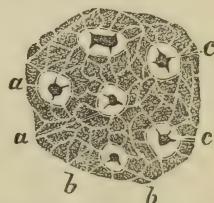
and that there are cone-like projections all along each fiber of living matter, the point of each of which is invariably directed toward the light reticulum throughout the basis-substance connecting one canaliculus with another (Fig. 4). This he found to be the case not only throughout bone-tissue, cementum, and dentine, but also in the enamel.

FIG. 4.



Union of dentine with enamel. D, dentine; E, enamel; a, a, dentinal fibers, being in union with large protoplasmic bodies b, c, d, or directly running into enamel-fibers e, g. The latter often are lost in the delicate irregular network on the bottom of the enamel f, f. Magnified 1200 diameters.

FIG. 5.



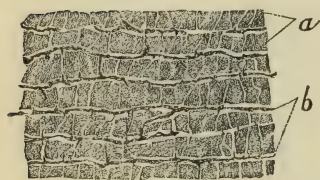
Cross-section of dentine of incisor stained with $\frac{1}{2}$ per cent. solution of chloride of gold. Main mass of dentine. Magnified 2000 diameters. a, a, dentinal canaliculi with the central dentinal fiber, c, c, the latter with star-like offshoots; the basis-substance between the canaliculi pierced by a delicate light network, b, b.

"In cross-sections of dentine the dentinal canaliculi are visible in the shape of round or oblong holes; the center of each is occupied by the dentinal fiber" (Fig. 5, c, c). Every fiber sends innumerable delicate conical threads into the basis-substance between the canaliculi, and throughout this substance is present a minute network of living matter. Around each canaliculus the basis-substance is denser than between the canaliculi. The fibers of living matter between the enamel rods (Fig. 6, b) are very slender, and the network within the rods (a) is extremely minute. Enamel is said to be calcified epithelium, and this is indicated by the well-marked resemblance between the enamel prisms and cuboidal epithelial bodies (Figs. 7 and 1). The prisms (b and c, Fig. 7, magnified 2000 diameters) have nuclei and granules, as do the cuboidal epithelial bodies, and like them are polyhedral and connected by very delicate threads of living matter (e). The origin of enamel is as yet an unsettled matter.

In some sections made from dry specimens there are visible what have been termed "interglobular spaces," but during the life of the tissue such a space contains protoplasm. "The dentinal fibers enter the protoplasm, and each fiber is united with the network of the

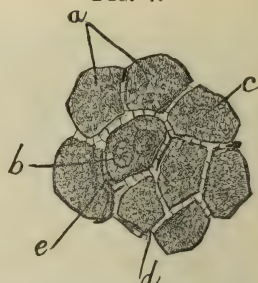
latter by means of delicate thorn-like projections." The protoplasm sometimes contained in the spaces in fresh specimens consists of

FIG. 6.



Longitudinal section of enamel. *a*, enamel-rods, traversed by prevailing vertical spaces; *b*, enamel-fibers, branching and partly uniting through delicate offshoots; numerous fine thorns of the fibers directed towards the light interruptions within the rods. Magnified 1200 diameters.

FIG. 7.



Cross-section through enamel. *a*, rods of enamel, partly exhibiting formations like nuclei; *b, c, d*, light interstices between the rods traversed by delicate beaded fibers, *e*, or by vertical thorns. Magnified 2000 diameters.

"embryonal elements which have not been transformed into basis-substance and not calcified." If the system be kept up to the normal standard of health and function be unimpaired, the fluid within the meshes of the network of living matter may be formed into glue-giving basis-substance, lime-salts be deposited, and tissue like that in which these spaces are found may be formed.

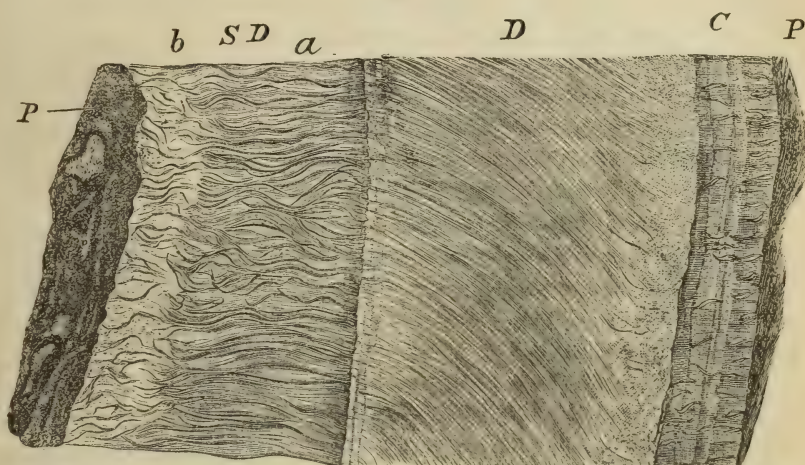
Fibers of living matter are not contained alone in the canaliculi of primary dentine (Fig. 8, *D*); they can be traced along through the canaliculi of "secondary dentine" (if present) to the protoplasmic bodies of the pulp as well (Fig. 8, *S D, a* and *b*); the canaliculi "run in bundles" and are regularly distributed in their course in the primary (*D*), and irregular and scanty in the (*a* and *b*) layer of secondary dentine.

The cementum is identical with bone; the lacunæ contain nucleated protoplasmic bodies—cement-corpuscles—and from these, delicate offshoots of living matter extend into the canaliculi throughout the basis-substance, and this is pierced by a network of living matter which is in uninterrupted connection with the network in the dentine. "The dentinal fibers are either in direct connection with coarser offshoots of the protoplasmic bodies of the cementum, or the light network of the basis-substance of the dentine is in communication with that of the basis-substance of the cementum." Some of the offshoots of one cement-corpuscle connect with those of other protoplasmic bodies (*a, a*, Fig. 9).

Fibers of living matter from the cement-corpuscles connect through the canaliculi of the cementum with the offshoots of protoplasmic

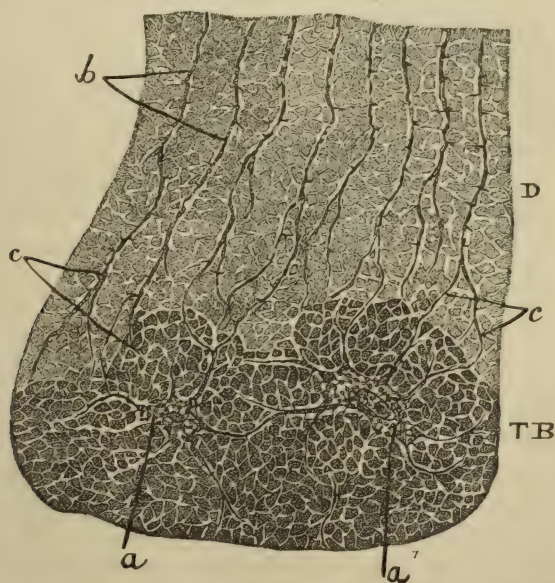
bodies (osteoblasts) in the pericementum. The network of living matter in the cementum is continuous with that of the pericementum, and the fibers from the connective-tissue corpuscles—the protoplasmic

FIG. 8.



Section of root near apex of an anomalous cuspid tooth. *D*, dentine similar to that found near the neck of a tooth,—the canaliculi stop short of its surface and are replaced by coarsely granular basis-substance; *SD a*, first zone of secondary dentine; *SD b*, second zone of secondary dentine, with a portion of the pulp. *C*, relatively narrow layer of cementum with remnants of the pericementum. Magnified 300 diameters.

FIG. 9.



Union between dentine, *D*, and cement, *TB*; *a*, *a*, cement-corpuscles with large branching offshoots, connected with each other as well as with the dentine-fibers, *b*, at the bifurcation of the latter, *c*, *c*. Magnified 1200 diameters.

bodies throughout the pericementum—connect with those of the adjacent bone-corpuscles of the alveolus; the living matter in the form of a reticulum is continuous throughout all these tissues.

There are two varieties of pericementum, the myxomatous and the fibrous; the former is the connective tissue, covering the cementum of the teeth of young persons, and in the adult this tissue changes to the fibrous variety. In pericementitis there is a return of the fibrous connective tissue to the embryonal condition. If the fibers of living matter connecting the connective-tissue corpuscles and forming the reticulum throughout the pericementum be not broken, the up-building of this or the formation of new tissue takes place through the course of embryonal to myxomatous, and then to fibrous connective tissue again. If the network of living matter be broken, the part torn ceases to be a tissue and pus is the result. After the healing of pericementitis there is not the same texture or grouping of the elements as at first,—a so-called “cicatricial tissue” is formed in which there is a closer and more irregular distribution of connective-tissue bundles. Pericementitis is either plastic or suppurative; in the first a new tissue is formed; in the second, the fibers of living matter are torn; the part ceases to be a tissue, and pus-corpuscles form from the embryonal mass.

In the extraction and replacement of teeth for the “cure” of abscess, there is tearing and then may be imperfect connection of the fibers and network of living matter, so that were the minute structure of the tissues of the part properly understood practitioners who would resort to extraction for such a purpose would be able to bring about healing by keeping the organ to be operated upon in its place. Extraction of a tooth or root or destruction of a pulp should very rarely be resorted to, because of the tearing of the network of living matter, even if it be only of a part, for be it remembered that all the tissues throughout the body are uninterruptedly connected by very fine fibers of living matter in the form of a reticulum.

Discussion.

Dr. Essig. My recollection of Dr. Bödecker's remarks is, that he referred only to his personal observations, and merely stated that he had never discovered during his microscopical investigations such an object as a vessel with a muscular coat in the dental pulp. He did not assert that there was not an arteriole present. I shall be glad to hear Dr. Webb's theory of how the circulation of the pulp is carried on.

Dr. Webb. Dr. Bödecker has made many sections of pulps, and he has not seen an artery, or a vessel with a muscular coat, in any one of those sections. He is cautious in making statements, and this caution gives me the more confidence in him.

Dr. Darby. I don't think Dr. Webb intended saying just what I understood him to say, that Dr. Bödecker was the first to discover the lacunæ and canaliculi in cementum and dentine. He probably intended to say that Dr. Bödecker was the first to describe the network of living matter in these. I agree with all he said about Dr. Bödecker as a careful, thorough histologist. I see no objection to the theory that the interglobular spaces in dentine may be, and are filled with the living matter, which under some circumstances may be calcified. The great difficulty in microscopical work, especially with the dental tissues, is to be sure of what you see. When specimens of enamel-tissue are prepared, they are usually ground on an emery or corundum-wheel, and into the structure of the specimen is ground dirt, etc., and the unpracticed and unskilled eye does not know what it is seeing. I do not for a moment question Dr. Bödecker's scientific knowledge in this direction. Dr. H. A. Moyer, of Kendallville, Ind., has recently sent me some very beautiful specimens of the dental tissues which he prepared and mounted.

Dr. Webb. It has long been known that in dry specimens of cementum there are visible, simply, lacunæ and canaliculi. Dr. Bödecker observed that in fresh specimens each lacuna contains a nucleated protoplasmic body, which does not quite fill the lacuna; and from this protoplasm fibers of living matter extend into the canaliculi and basis-substance. An educated microscopist knows what he sees in the field he is examining; he can distinguish any foreign matter that may accidentally be present in the specimen. I have been in Dr. Heitzmann's laboratory, in New York, long enough to know that he requires his pupils to find out and state all that may be in the focus, and have also heard him criticise some students (both dental and medical) quite earnestly for imagining that they saw something when they did not. For instance, a medical student said to him one day, while diagnosing a case with the microscope,—“Doctor, I find that one must take a good many things for granted!” “No, sir!” said Dr. Heitzmann; “I don't allow any one of my pupils to take anything for granted in my laboratory. If I tell you that there is something in the focus which you cannot find, please mention it, and kindly allow me to show you.” Dr. Heitzmann has been making a specialty of histology for fifteen years. Dr. Bödecker has been a pupil of his for four years, and is a very careful and thorough investigator. Not only this, but he started out with the great advantage given him by Dr. Heitzmann's long years of study.

Dr. Tees. Dr. Bödecker, in an essay upon “Pericementitis,” in the December (1879) number of the DENTAL COSMOS, in treating of that form known as alveolar abscess, gives the *death of the pulp* as one of the results to which it leads. During a practice of many years, I

have never met with a single case where there was swelling of the muscular tissues which was not the result of a devitalized pulp, and I never hesitate even in the incipient stage of soreness and elongation to drill into the tooth in order to give relief. Systemic derangement or "catching cold," as it is commonly called, leading to this condition, alterative medicines are indicated. I prescribe podophyllin, with the tincture of capsicum and spirit of ammonia.

Dr. Darby. Until five years ago, my experience was much the same as that of Dr. Tees. I would have said it was impossible for an abscess to form upon a living tooth. About that time a lady called upon me with an abscess which was evidently at the root of the first superior molar, or arising from a diseased state of its pericementum. Without the slightest hesitation, I commenced drilling through the masticating surface of the tooth (it had never been carious). After going a short distance towards the pulp, to my surprise I found the dentine sensitive, and farther on found a living pulp in the tooth. The abscess had arisen from irritation to the pericementum, caused by tartar which had been deposited far up under the gum upon the root of the tooth. Since then I have met with several such cases, and am fully satisfied that teeth with vital pulps may have what I call *external* abscesses.

Dr. Essig. I have a tooth in my own mouth around which I have experienced all the phenomena of alveolar abscess, and yet, from the manner in which it responds to cold, there can be no doubt of its full vitality.

Dr. Webb. There is a difference between alveolar abscess and pericementitis around the neck of a tooth. Alveolar abscess is the breaking down of tissue into pus about the end of a root, while pericementitis (or "Riggs's disease") about and beyond the neck of a tooth is a suppurative inflammatory process, and necrosis of a portion of the surrounding alveolar border may follow. The first step for the cure of alveolar abscess is to get rid of the pus, which is a direct product from the inflamed part or tissue involved about the end of the root. Pericementitis (or "Riggs's disease") usually subsides after the thorough removal of calcareous deposits from the neck of the tooth, or the cutting away of the necrosed portion, if there is necrosis of the alveolar border.

Dr. Dixon. I think alveolar abscess is very often the result of a dying pulp. I recently had a case of it where the pulp had been devitalized and the tooth been filled for sixteen years, and never had given any trouble until this time.

Dr. Darby. I do not believe more than one root in fifty is filled to the apex, when such an operation is undertaken. The failure is discovered when the teeth are split open after extraction. The best

of men fail in their efforts to carry the filling-material to the apex. We all know that some teeth remain comfortable for years when no effort has been made to fill the roots. Many a devitalized tooth with a putrescent pulp within it remains comfortable, and the only inconvenience it gives the person is an occasional loosening when a cold is taken, or when from some cause the system runs a little below par. Whenever we find teeth with devitalized pulps it is our duty to remove the pulps, cleanse and disinfect the teeth, and fill as thoroughly as possible.

Dr. Webb. In reference to the case Dr. Dixon speaks of, where abscess took place after the pulp-chamber had been filled sixteen years, I would say that a particle of foreign matter must have remained and been tolerated at the end of the root, until the normal standard of the health of the patient and the tonicity of the parts became lowered, thus favoring pericementitis and alveolar abscess. When the subject of the extraction and replacement of teeth for the cure of alveolar abscess was being discussed at a late meeting of the Odontological Society of Great Britain, Charles S. Tomes stated that "complete absorption of the roots is the accident to which replanted teeth are liable." Absorption is not an "accident," but an inflammatory result of the breaking down of the tissue occasioned by the tearing of the fibrous tissue and the network of living matter when extraction is resorted to. The absorption referred to is the dissolving away of the lime-salts in the basis-substance of the cementum, and the bay-like excavations are filled with protoplasmic bodies (myeloid bodies—"giant cells"). These excavations almost always result from pericementitis; new formation of cementum may take place, especially when extraction is not resorted to, and the fibers of living matter are not torn.

Dr. E. R. Pettit. It is extremely important that we should determine before drilling into a pulp-cavity that the pulp is really dead or dying, or that the pericementitis is due to some other cause. A somewhat uncommon cause of this disease is the presence of nodules of secondary dentine in the pulp, the sharp spiculæ of which at times produce great irritation and severe pericementitis. I had once a marked illustration of this in a case which I diagnosed to be either a dying pulp or the presence of these nodules. As the tooth had no antagonist, and the patient was suffering intensely and insisted upon its extraction, I yielded to her desire and consented to remove it. In endeavoring to do so, however, I broke off the crown. After extracting the root I examined the pulp and discovered a sharp spicula of secondary dentine which I could move about with the pulp, and which doubtless was the sole cause of the trouble. The examination of the pulp of the adjoining tooth, subsequently extracted

for the same cause, showed no signs of these nodules to the naked eye, but I had no reason to doubt the presence of minute spiculæ, which the microscope would doubtless have revealed, as the severe pericementitis could be attributed to no other cause. The patient stated that she had lost nearly all of her back teeth from the same cause. I rarely ever attempt to preserve the pulp alive by capping, if there has ever been any pericementitis resulting from its exposure. Experience has taught me that such pulps will almost invariably, sooner or later, give trouble. I have also never, I believe, been able to preserve a pulp alive when it became so irritated by thermal changes or shocks through the filling as to become more sensitive to warm liquids than to cold. In every such case I believe it is better to drill into the pulp-cavity at once, especially if pericementitis accompanies it. But so long as the pulp remains more sensitive to cold than to heat, I am satisfied that it will return to its normal condition.

Dr. Webb. I will try to give an explanation of the reason why cold relieves pain to a certain degree, and heat intensifies it. When shock in healthy tissue takes place on account of cold, warmth restores the nutrient currents. For instance, if a large cavity be filled with gold without the dentine's having been given such a protection from thermal currents as oxychloride of zinc affords, cold fluids shock the tissue, and the pain which follows usually ceases upon the application of heat. When anything irritates the pulp there is an increase in the neural and vascular currents to the part. Cold drives or keeps back part of the molecules of living matter and the blood-corpuscles, and ease for the time at least is secured. Heat induces acceleration of the currents, thus favoring the swelling of the granules throughout the protoplasmic bodies of the pulp, and those at the point of intersection in the network of living matter; the blood (the flow of which is increased by the warmth) in the capillaries so presses upon the fibers of living matter, that the pain is intensified until the vessels are ruptured, and the fibers are torn at the end of the root.

The regular meeting of the society was held on Saturday evening, January 3, at the residence of Dr. Daniel Neall, 1627 Summer Street.

INCIDENTS OF PRACTICE.

Dr. Essig described the audiphone as made at present, and thought it could be improved upon by having a diaphragm attached and something for the teeth to grasp.

Dr. Jack related an anecdote of a deaf gentleman who heard the conversation of two friends by placing one end of a key against a

column in the room, and the other end between his teeth. The labyrinth of the ear and its nerves were in a normal condition. He thought an audiphone made of thin metal would be more sensitive to impressions than one made of hard rubber. He referred to the importance of the mouth in the conveyance of sound, since in listening to faint sounds it is kept open.

Dr. Dixon. I would like to call attention to tin foil as a material for permanent fillings. I have used it of late much more than formerly, having had my attention drawn to it particularly by finding teeth filled with it in 1876 by the late Dr. De Morat. First-class gold fillings in the same mouths, made at the same time by the same hand, had needed repeated repairs, without which the teeth would have been lost. Tin foil, as now prepared, is very soft and plastic, and easily made into excellent fillings. I conscientiously bring the matter before the society, believing that very frail teeth can be better saved by tin than by gold fillings in many cases, probably owing to its lower conductive power. Besides, I do not remember having ever met with a devitalized pulp under a tin filling where devitalization had not taken place prior to its insertion. I also think that fillings well made of the tin as now prepared last much longer on the grinding surfaces than they did years ago.

Dr. Jack. I have found shredded tin unsatisfactory, as the particles do not become united, and are too small to exert any binding force upon each other.

Dr. Darby. In approximal cavities which do not extend to the masticating surface, tin is as good, if not superior to gold, as a material for filling. It does not discolor tooth-structure like amalgam.

Dr. Jack. The excellent preservative properties of tin are due principally, I believe, to its softness and pliability, which render it not difficult to adapt to the surface of the cavity without the employment of much force. This, it seems to my mind, accounts for its superiority over gold in very soft teeth. I have had opportunity to know that the force requisite to solidly pack and condense gold is frequently injurious to the enamel borders of cavities. This is more particularly the case where ordinary mallets are employed in filling teeth, because, if the first gold against the cervical walls is packed to a proper degree of solidity, every subsequent blow of the mallet extends its force to the last layer. The repetition of blows may often be damaging to enamel borders of imperfectly calcified enamel, which would have no perceptible effect upon sound and flinty enamel. I have even observed injury inflicted upon the margin of cavities by hand-pressure when I have had reason to believe the instrument had not been in contact with the tooth. Tin has also the further advantage of being an indifferent conductor of heat.

Dr. D. Neall. I used tin largely thirty-five years ago, but subsequently preferred gold, as then it was quite as adaptable as tin, and not so subject to waste as the latter upon the grinding surfaces. I have used it somewhat lately, and hold it to be a metal less incongruous with tooth-substance than gold. I put in a tin filling in 1843. I had watched it for thirty years. At the end of this period it had worn away considerably, but the margins of the cavity did not decay. I put in a cap of gold foil upon it, and both fillings remain sound and secure to this day. I think we must admit that experience demonstrates that tin is kindlier in its union with tooth-substance than many of the gold foils of the present day.

Dr. E. H. Neall. In certain cases, where the teeth show a low degree of calcification, as well as in the mouths of young children, I think tin foil an excellent filling material, as it can be easily and quickly packed and quite as readily trimmed down flush with the margin of the cavity; indeed, very often the plug can be consolidated and nicely finished with a strong burnisher, so that the corundum disk need not be used, thereby sparing the enamel borders from the least abrasion. Some eight years ago I used a great deal of tin in the mouths of children; many of these fillings I have seen from time to time, and, with the exception of being worn down by mastication, they are in excellent condition, thoroughly preserving the teeth, and also without the discoloration noticeable around amalgam fillings. The tin foil supplied the profession at present I think of superior quality.

AMBLER TEES, D.D.S., A.M., *Recording Secretary.*

FIRST DISTRICT DENTAL SOCIETY.

THE twelfth annual meeting of the District Dental Society of the First Judicial District of the State of New York was held in New York City on the first Tuesday evening in April, 1880. The following were elected officers for the ensuing year:

President.—Dr. J. W. Clowes.

Vice-President.—Dr. W. T. La Roche.

Secretary.—Dr. G. W. Weld.

Treasurer.—Dr. Charles Miller.

Censors.—Dr. A. L. Northrop, Dr. W. A. Bronson, Dr. E. A. Bogue, Dr. Frank Abbott, Dr. C. A. Woodward.

Executive Committee.—Dr. Charles Miller, Dr. A. L. Northrop, Dr. C. A. Woodward.

G. W. WELD, *Secretary.*

UNIVERSITY OF MICHIGAN—DENTAL DEPARTMENT.

THE fifth annual commencement of the College of Dental Surgery of the University of Michigan, Ann Arbor, Michigan, took place on Wednesday, March 24, 1880, at 2½ o'clock P.M.

The address to the graduates was delivered by J. A. Robinson, D.D.S.

The degree of D.D.S. was conferred upon the following members of the graduating class:

NAME.	RESIDENCE.	NAME.	RESIDENCE.
William B. Armentdt.....	Kentucky.	Amos Marion Long.....	Michigan.
Thomas W. Beckwith.....	Illinois.	Frank Flavius Little.....	Ohio.
Uriah D. Billmeyer.....	Michigan.	Ossian C. Moon.....	Indiana.
William F. Bradner.....	Michigan.	Arthur C. Nichols.....	Michigan.
George Heart Brown.....	Michigan.	Evelyn Pierrepont.....	England.
David E. Callaghan.....	Japan.	Douglas Potterf.....	Ohio.
John Peter Carmichael.....	Illinois.	William J. Poyser.....	Ohio.
Suel Erastus Clark.....	New York.	John N. Reynolds.....	Pennsylvania.
Williams Donnally.....	Kentucky.	Collins McKnight Roe.....	Ohio.
Hiram Edgar Dunn.....	Pennsylvania.	Maurice J. Sullivan.....	California.
Alma W. E. Fuellgraff.....	Germany.	Ira Emmet Sampsell.....	Ohio.
Frank F. Hoyer.....	New York.	Charles Edwin Stroud.....	Ohio.
Alfred Wright Hoyt.....	Wisconsin.	Immer C. St. John.....	Minnesota.
Ormand C. Jenkins.....	Michigan.	Oliver Stacy Voak.....	New York.
Aaron C. Johnson.....	Michigan.	Julius Charles Waldron.....	Ohio.
George F. Kimball.....	Michigan.	Wilbur Silvius Whisler.....	Ohio.
Thomas C. Leiter.....	Ohio.	Robert Addison Young.....	Michigan.

ILLINOIS STATE DENTAL SOCIETY.

THE sixteenth annual meeting of the Illinois State Dental Society will be held at Bloomington, on Tuesday, May 11, and continue four days. Dentists from other States are cordially invited to be present.

EDMUND NOYES, *Secretary.*

MASSACHUSETTS DENTAL SOCIETY.

THE semi-annual meeting of the Massachusetts Dental Society will be held at 167 Tremont Street, Boston, Mass., on Thursday and Friday, June 3 and 4, commencing at eleven o'clock on Thursday. All interested in dentistry are invited to be present.

W. E. PAGE, D.M.D., *Secretary.*

NORTH CAROLINA STATE DENTAL ASSOCIATION.

THE fifth annual session of the North Carolina State Dental Association will be held in the city of Raleigh, commencing on Tuesday, the 1st day of June, at twelve o'clock M.

W. H. HOFFMAN, *Secretary.*

INDIANA STATE DENTAL ASSOCIATION.

THE twenty-second annual meeting of the Indiana State Dental Association will be held at Indianapolis, commencing June 29, 1880, at one P.M.

W. H. HALL, *Secretary*.

EDITORIAL.

FRAUDULENT MEDICAL AND DENTAL DIPLOMAS.

THE United States Minister to Berlin having written to the Bureau of Education at Washington with reference to the sale in Germany of bogus diplomas issued by alleged colleges and universities in Philadelphia, the Commissioner of Education addressed a letter to the Mayor of this city, asking special information as to the reputation and status of the following-named institutions:

1. The American University of Philadelphia, (and) Eclectic Medical College of Pennsylvania, No. 514 Pine Street. John Buchanan, M.D., President.

2. The Philadelphia University of Medicine and Surgery, No. 209 North Tenth Street. T. B. Miller, M.D., Dean.

3. The Penn Medical University (or College), Brown Street, east of Twelfth.

In 1871 the two first-named establishments were charged before a committee of the Legislature of Pennsylvania with the issuing of diplomas for money to those who had never been students in their classes. The committee reported that the charges had been sustained, and the Legislature passed acts repealing their charters. Subsequently the Supreme Court, on technical grounds and without reference to the merits of the case, decided that the act repealing the charter of the first named was unconstitutional. Following this, the Attorney-General of the State initiated proceedings against the so-called American University, but unfortunately died before accomplishing his object. In February, 1879, by joint resolution of the Legislature, the Attorney-General was directed to institute proceedings against these institutions on account of abuse of their franchises, but, so far as is known, no result has been reached in the matter by the officer so charged. On one or more occasions the City Councils of Philadelphia have passed resolutions with reference to the disgraceful concerns, and time and time again the public press has denounced them. Quite recently the Philadelphia Methodist Conference investigated the disreputable practices of Rev. T. B. Miller (late dean) in the issuance of diplomas, and promptly expelled him from their number.

Neither of the two first-named so-called universities or colleges

seems to have any object of existence or pretended existence except the sale of worthless diplomas, but, although their true character and scandalous career are so well known at home, they seem to be able to impress foreigners that their diplomas are worth possessing. The reputation of Pennsylvania, of Philadelphia, and of the venerable University of Pennsylvania is thus made to suffer by the failure of the constituted authorities to compel the closing of the doors of the swindling institutions.

There is, however, another side to this nefarious traffic. If the receiver of stolen goods is justly considered as bad as the thief, surely the purchaser of a fraudulent diploma is as guilty as the vendor thereof. If there were none willing to obtain credit for medical or dental training on false pretenses, the manufacturers and vendors of bogus diplomas would find their occupation gone.

As this infamous business seems to have flourished chiefly in this city, we present for the benefit of our foreign readers the following list, which includes all of the recognized medical and dental colleges of Philadelphia. Diplomas purporting to emanate from any other medical or dental institution claiming existence in this city are not considered as of any value.

University of Pennsylvania, Medical Department, Thirty-Sixth Street and Woodland Avenue (Darby Road). James Tyson, M.D., Secretary of the Faculty of Medicine.

Jefferson Medical College, Tenth Street, below Sansom. Ellerslie Wallace, M.D., Dean.

Woman's Medical College, North College Avenue, corner Twenty-First Street. Rachel L. Bodley, A.M., Dean.

Hahnemann Medical College (Homœopathic), 1105 Filbert Street. A. R. Thomas, Dean.

Pennsylvania College of Dental Surgery, corner Twelfth and Filbert Streets. C. N. Peirce, D.D.S., Dean.

Philadelphia Dental College, 108 North Tenth Street. James E. Garretson, M.D., D.D.S., Dean.

Dental Department, University of Pennsylvania, Thirty-Sixth Street and Woodland Avenue (Darby Road). Charles J. Essig, M.D., D.D.S., Secretary of the Faculty of Dentistry.

BROMIDE OF ETHYL.

THIS new anæsthetic is receiving a considerable amount of attention from various investigators. We published in the DENTAL COSMOS for April, department of Hints and Queries, a communication from Dr. L. G. Noel, giving his experience with it in the extraction of teeth in several cases. In the same department of the current

number we give the experience of another dental practitioner, the results being equally favorable. Nevertheless, we advise our readers to be cautious about the employment of this agent until its physiological effects are better understood. Already one death is reported under its use, and there is reason to fear that its action, like that of chloroform, will cause death by sudden paralysis of the heart.

Since writing the above, and just as we are going to press, we have been favored with proof-sheets of an article (to appear in the next issue of the *Philadelphia Medical Times*) by the editor, Prof. H. C. Wood, in which is recorded a series of experiments upon dogs with the bromide of ethyl, in order to determine its physiological action. The following extracts embody Dr. Wood's conclusions, based upon his experiments, which are detailed at length in his article:

The important physiological difference between chloroform and ether is in their action upon the heart, and my experiments have been chiefly directed to determining whether the bromide, like chloroform, is depressant to the arterial pressure, and therefore probably dangerous as an anæsthetic, or whether it shares the stimulant powers and the safety of ether. As an anæsthetic I have found it fully as prompt as chloroform, but more evanescent in its influence. . . .

Extended analysis of these experiments is scarcely necessary. They certainly show that the bromide may cause anæsthesia without reducing the blood-pressure, but they also indicate that it is distinctly depressant to the circulation, reducing, when in excess, the force of the blood-current to a very marked extent. The suddenness of the drop in the arterial pressure seen in the latter part of Exp. II. is unpleasantly suggestive of what has been witnessed so frequently in the surgical amphitheater during the administration of chloroform. In Exp. III. a still more sudden loss of heart-power occurred, the arterial pressure going down over forty per cent. in a single minute. In the human being such a change of the pulse-force would be most alarming. . . . The bromide would seem, therefore, to rival the older anæsthetic in its depressant influence upon the circulation. That this action is exerted upon man as well as upon the lower animals is apparently shown by the sphygmographic studies which have been made at the University Hospital by Dr. Sheppard, Resident Surgeon.

The next step in this study of the bromide was to determine whether the fall of arterial pressure is due to a direct action upon the heart. It was found that when the cut-out heart of the frog is touched with a drop of the bromide, or even when it is hung in the concentrated vapor, all movements cease at once. This, of course, indicates that the drug acts directly upon the heart-muscle or its contained ganglia. . . .

The tracings do not need any discussion; taken along with the trials made upon the frog's heart, they prove that the bromide of ethyl acts as a cardiac paralyzant. The influence of this anæsthetic resembles, therefore, that of chloroform, and not that of ether; and it is altogether probable that it shares the dangerous properties of chloroform. It has been given, it may be, a few hundred times without causing a cardiac death, but how many thousands of times in succession is chloroform often administered in a city without a fatal issue!

The great superiority claimed for the bromide over ether has been its being less apt to produce sickness than is that anæsthetic. It does not appear, however, that

this claim is just, even as regards the comparison with ether, at least if the anæsthesia is maintained for any length of time. In Dr. Marion Sims's case the death was probably produced by the bromide, and in the few cases in which the drug has been used in the University Hospital Clinic, the after-vomiting has been usually severe. In one man it lasted for many hours, and is said to have been sufficient to have caused serious alarm.

BIBLIOGRAPHICAL.

HEADACHES. Their Nature, Causes, and Treatment. By WILLIAM HENRY DAY, M.D., etc. Third edition. With illustrations. Philadelphia: Lindsay & Blakiston, 1880.

This is a systematic, and therefore convenient monograph, a practically useful manual for the practitioner. The diagnostic features of the several varieties of headache are carefully described, and the therapeutic indications thoughtfully considered.

The volume is divided into sixteen chapters, treating of cerebral anæmia and hyperæmia, of sympathetic, dyspeptic (or bilious), congestive, nervo-hyperæmic, toxæmic, gouty, neuralgic, and rheumatic headaches; of headaches from plethora and exhaustion, from affections of the periosteum; of organic or structural headaches; of those of childhood and early life, and those of advanced life. The directions for treatment are full and clear, and we commend the book as well worth diligent perusal.

OBITUARY.

ACTION OF THE DENTAL PROFESSION WITH REFERENCE TO THE DEATH OF DR. SAMUEL S. WHITE.

At the annual meeting of the Vermont State Dental Society, held at Pavilion Hotel, Montpelier, Vermont, March 17, 1880, the committee on resolutions reported the following, which were unanimously adopted:

WHEREAS, The painful intelligence has come to our society that Dr. Samuel S. White has, by the dispensation of a Divine Providence, which, although we cannot understand, yet to which we humbly bow, been called from this world to that beyond; therefore

Resolved, That the dental practitioners of Vermont fully recognize the obligations the dental profession owes to the late Samuel S. White through the active agencies he has awakened for the elevation of the art, as displayed in useful inventions which he has introduced, and in the dental literature which he has provided.

Resolved, That a copy of these resolutions, signed by the president and secre-

tary of this society, be transmitted to the family of the deceased; that a copy be preserved in the archives of this society and published in the DENTAL COSMOS.

JAMES LEWIS, }
O. P. FORBUSH, } *Committee.*

JOSEPH L. PERKINS, *President.*

CHARLES D. NEWELL, *Secretary.*

PERISCOPE.

ON NERVOUS DISEASES CONNECTED WITH THE TEETH.—*Mr. President and Gentlemen:* The pain of toothache localized in a decayed tooth is unfortunately so common that every sufferer diagnoses it for himself, and although it may be reckoned among the nervous disorders connected with the teeth, I need not say anything about it.

But toothache may be associated with other pains, or may even be replaced by them, and then the diagnosis is by no means so easy. The true cause of the pain may, indeed, remain unsuspected even by competent medical men, and their treatment may consequently be comparatively ineffectual. My attention was first drawn to the connection between decayed teeth and nervous disorders having little or no apparent relation to them by an incident which occurred a good many years ago, when I was a student. I had just heard that one of the best means of relieving toothache was to insert a pledget of cotton-wool, dipped in melted carbolic acid, into the cavity of the aching tooth, care being, of course, taken to squeeze out the superfluous acid, and to cover the pledget with some clean wool, so as to protect the tongue. I was very anxious to test the information I had received, and shortly afterwards an opportunity presented itself. A maid-servant had complained for some days of headache in the left temple of a severe neuralgic character, and associated with this was a certain amount of toothache, which was, however, less complained of than the headache. I plugged the offending tooth with cotton-wool dipped in melted carbolic acid, but was greatly disappointed to find that it produced little or no apparent benefit. In less than half an hour, however, the girl informed me that the pain in the temple and the toothache were both entirely gone. Their disappearance was not due to the carbolic acid's having required time to exert its action, but to its having been applied to a different point. The girl had taken it out of the cavity of the decayed molar into which I put it at first, and transferred it to another tooth, of which she had not complained, and which I had not suspected. Immediately the pain disappeared, both from the tooth and the temple.

In this case pain was felt in the tooth as well as the head, and the headache might be looked upon as simply irradiation of the pain from the tooth. But that headaches may occasionally depend upon caries of teeth in which no pain whatever is felt, is, I think, shown by what once happened in my own case. I had been suffering from migraine, the pain being limited to a spot in the left temple. There was tenderness on pressure on one spot below and in front of the parietal eminence. On several occasions I had noticed that the left eyeball was tender on pressure; but one day I was suffering from

headache, and yet found that the eyeball was not tender. I pressed my finger all over my face in the endeavor to find a second tender spot, and at last I found one under the angle of the jaw. But the tenderness here was due to a small gland, which was hard and painful to the touch. Hardness, enlargement, and tenderness in a gland generally indicate more or less inflammation in it, and the most probable cause of such a condition is, of course, the irritation excited in the gland by foreign matter conveyed to it by the lymphatic vessels. I accordingly began to examine the mouth and teeth from which the lymphatic vessels proceeded to the gland in question. Nothing abnormal was to be noticed in the lips, cheeks, tongue, or gums, so I tested the teeth by percussion with a blunt steel point, and on the posterior aspect of the last molar on the left side of the lower jaw I found a spot which was very slightly tender. I accordingly went at once to a dentist, and learned that caries had just begun at that spot, but had not caused any cavity whatever. I had never suffered the least pain in the tooth, and but for the headache which led me to percuss the teeth systematically I should in all probability never have suspected the caries until it was far gone. The connection which was here found to exist between temporal headache and a decayed tooth is, I think, interesting, not only as showing a causal relation between the caries and the headache, but as helping to explain the pathology of migraine.

A good deal has been written on this subject, and there is a considerable diversity of opinion among different writers. Professor Du Bois Reymond, who suffered a good deal from it, attributed it to spasm of the vessels, for he found that, during the pain, the temporal artery became tense and hard, like a piece of whip-cord, and the pupil of the eye on the affected side dilated as if the sympathetic in the neck had been irritated. Others have discarded this explanation, because they found that the vessels, instead of being firmly contracted, were distended widely, and throbbed violently, and they have attributed the pain in the head to the congestion of the vessels.

These two explanations of the pain of migraine, the one attributing it to anæmia, and the other to congestion, are apparently irreconcilable. My own case gives, however, I think, an explanation of the discrepancy. Both statements are correct, but both are incomplete, and the reason is that their authors have only observed the arteries during a part of their course, instead of tracing them backwards to the large trunks from which they sprang, and onwards to their smaller ramifications. In my own case I have found that on some occasions the temporal artery was hard and contracted, like a piece of whip-cord, as described by Du Bois Reymond. On others I found the temporal artery widely dilated, and pulsating violently, and yet I could distinguish no difference between the pain I felt on these different occasions. So, not contented with noting the condition of the temporal artery only at its middle, I followed it onwards to its smaller branches, and backwards to the carotid.

Then I found that a constant vascular condition existed during the headache, notwithstanding the apparent differences in the state of the temporal artery. This constant vascular condition consisted in dilatation of the artery at its proximal, and spasmodic contraction at its distal, extremity. The carotid artery was almost invariably

dilated and throbbing. Sometimes the dilatation would extend as far as the trunk of the temporal artery, but sometimes the temporal was contracted. Even when the temporal artery was dilated, if one only followed it to its smaller ramifications they were found to be firmly contracted and cord-like. If one may reason from this single instance, connecting as it does the examples of vascular dilatation and contraction given by other authors, we may say that the pain of migraine depends neither on contraction nor on dilatation of the vessels *per se*, but upon dilatation of the one part of the vessel with spasmodic contraction of another, or, if we might so term it, upon a state of colic in the vessels themselves. This irregular contraction of the vessel is almost certainly due to disordered vaso-motor innervation. The cause of this disorder is to be sought in the sympathetic system, and the observation of Du Bois Reymond regarding the condition of the iris may lead us to connect it with the cervical ganglia. From these ganglia vaso-motor fibers proceed along the carotid and its branches, and if we regard disorder of these ganglia as the cause of migraine we are at once in a position to explain some of the symptoms which occasionally accompany it. Thus, I have observed that sometimes the pain in the temple would suddenly cease, and be replaced by pain in the occipital region. Sometimes, also, we have affections of the sight, such as general dimness of vision, diplopia, and spectra—colored or uncolored. The transference of pain from the temple to the occipital region is probably caused by transference of the spasmodic contraction from the temporal to the occipital artery, and the disorders of the sense of sight we may reasonably regard as caused by alterations in the intercranial branches of the carotid, similar to those which we can detect by the finger in its temporal branch. The disturbance in the sympathetic system, which I regard as the cause of migraine, may not always have its origin in the teeth; it may, and very probably does, sometimes originate in the eyes, but in the instance which I have already noted as occurring in my own case, the irritation started from the lymphatic gland, on or about which branches of the sympathetic probably ramified. The tooth itself, although the real cause of the sympathetic irritation, did not produce it directly, but indirectly. From the root of the tooth the lymphatics conveyed irritating matter to the gland, and the irritation here excited acted in its turn as a disturber of the sympathetic nerves which furnish the vaso-motor supply to the carotid and its branches.

The connection between dental caries and neuralgia was first noticed by Neucourt,* and he gives rules for diagnosing a causal relation between caries and neuralgia. When the pain, which is at first widespread, gets localized in the course of a few days in the dental region, and is succeeded by redness, swelling, and tenderness on pressure of the gums, the neuralgia is almost certainly of dental origin. In these cases the patients are restless, and the pain is more or less constant, with no distinct intermissions; the pulse is more frequent and hard, and there is not infrequently sweating. If the pain is followed by a gumboil, the tooth, he thinks, is certainly decayed, although it should present no appearance of caries, and this he con-

* F. Neucourt, Arch. Gén., Juin, 1849.

siders to be also the case if the tooth appears longer than the others and is painful on percussio. Tenderness on percussion is considered by Richter* to be the most certain sign. The diagnosis may be assisted by noticing whether the neuralgia when disappearing lingers longest in one of the teeth.

The exact pathology of neuralgia has not yet been settled, but Val-leix, one of the great authorities on the subject, gave as its distinctive points the presence of spots which were tender on pressure, and the effect of pressure in increasing the pain. These spots have been noticed by Neucourt† in neuralgia depending upon dental irritation, and he has also observed the absence of increased pain on pressure in true neuralgia, so that no distinction can be drawn between neuralgia due to dental irritation and neuralgia depending upon other causes.

Although the most frequent seat of pain due to carious teeth is the temporal region, yet, as one would expect, we find it also in parts of the neck. A few weeks ago I was consulted by a lady regarding her throat. She had pain opposite the upper part of the thyroid cartilage on the right side, and thought that she had inflammation at that point. Laryngoscopic examination showed the larynx to be perfectly healthy, but I found one of the molars on the same side as the painful spot to be extensively diseased. The pain from which she suffered, I have little doubt, was caused by the decayed tooth; but, as she refused to have it extracted or stopped, I could not absolutely verify my diagnosis. I put her upon a course of tonics and the pain almost completely disappeared.

This would be said by some to prove my diagnosis to be wrong; for if the pain depended on the presence of a carious tooth, how could it disappear while the tooth remained unattended to? But we must always remember that the actions which take place in the animal body are not so simple as those which occur in the test-tube of a chemist. Yet even in the test-tube we require more than one reagent to produce a reaction; and if one of the substances or conditions necessary for the reaction be absent it does not occur, even though other conditions be present. In the same way we know that a decayed tooth does not always cause toothache, and that toothache, when present, may frequently be removed by the use of a saline purgative. The tooth still remains as a source of irritation, but the state of the nervous system has been so altered by the purgative, that pain is no longer produced by the irritation. In the same way we may not infrequently relieve the neuralgia originating from decayed teeth by a judicious course of aperients and tonics. This is so far advantageous to the patient, that it relieves him from pain; but it is, on the other hand, disadvantageous, inasmuch as it causes the medical man to overlook the real source of the evil, and allows the dental caries to proceed instead of having it arrested by suitable stopping. In the case I have just mentioned; the pain in the larynx, which I attributed to the decayed tooth, did not lead to any change in the nutrition or functions of the larynx. Pointis,‡ however,

* Richter, Schmidt's Jahrbucher.

† F. Neucourt, Arch. Gén., Oct. to Dec., 1853; Jan. 1854.

‡ Pointis, Journ. des Com. Méd. Prat., Sept., 1846.

records a case in which, after severe toothache, the patient suddenly lost his voice, and the aphonia was followed by anorexia, cough, wasting, and feverishness, which led to the belief that he was suffering from laryngeal phthisis. But the lungs were sound, and there was no tenderness over the larynx. There was slight inflammation of the pharynx, and all the molars on the left under jaw were decayed, and the gums and periosteum around them were swelled. The teeth were removed, the gums cauterized, and gargles employed. On the very day the teeth were extracted the suffocative spasms which had troubled the patient abated, and on the following days the other symptoms quickly disappeared.

The irritation caused to the larynx by the process of dentition is well recognized, and has led to the employment of the term teething-cough. The existence of a real causal connection between cough and teething has been doubted; but there are cases on record which seem to show that this really does exist. One very marked instance of this sort has been recorded by Paasch.* A child, four months old, had a paroxysmal laryngeal cough, during which it was nearly suffocated, opening its mouth and throwing the head back. Narcotics were of no use. The gum of the lower jaw was swelled, and vesicular swellings appeared at the part of the gums corresponding to the middle incisors. These increased in size and became dark, livid, translucent, and fluctuating. During their growth the cough increased; but when the right incisor came through the gum, and one vesicular swelling broke, the cough ceased. After twenty-four hours it again began, though less violent than before. After some days the second incisor came through, the second vesicle burst, the cough at once began to disappear, and at the end of two days had entirely and forever gone.

From the close connection that exists between the throat and the ear we would expect deafness to be not infrequently the consequence of dental irritation. It seems, however, not to be very frequent, although it does exist, as shown by the following case recorded by Koecker.† A man, aged forty-eight, suffered from suddenly increasing deafness; but after his teeth, which were carious and had caused suppuration of the gums, were extracted he completely regained his hearing.

The eye is much more frequently affected than the ear, and blindness is by no means an uncommon result of dental decay. Mr. Jonathan Hutchinson has recorded some cases of this, and he regards the blindness as reflex, and analogous in its causation to essential paralysis of children. The sight is suddenly lost, but there are no cerebral symptoms. The optic nerve is sometimes atrophied, but sometimes not. The blindness is generally preceded for a long time by facial neuralgia, associated with toothache. A more striking case than any of Mr. Hutchinson's is recorded by Dr. De Witt.‡ A perfectly healthy man, aged thirty-one, suddenly noticed, in attempting to fire off a gun, that his right eye was completely blind. He had neither pain nor subjective appearances of light in the eye. He was able to

* Paasch, *Journ. of Kinderkr.*, 3, 4, 1856.

† Koecker, *Med.-Chir. Rev.*, Jan. 1843.

‡ De Witt, *American Journ.*, N. S., ex., p. 382, April, 1868.

distinguish light from darkness with it, but nothing more. No cause for this blindness could be discovered until twelve years afterwards, when it was found that the patient had had several teeth stopped two months before his blindness. For a long time afterwards he suffered from pain and tenderness in the first molar of the right side. The gums swelled and ulcerated, and frequent abscesses formed, which he opened with his knife. The stopping was at length removed from the tooth, and this at once relieved the irritation of the gums and increased the power of sight. In three weeks, however, when the sight had already become considerably better, the gums again ulcerated, and the sight became immediately worse. The decayed tooth was then extracted, and the sight became permanently improved, although it never became quite so good as that of the other eye.

The connection between the teeth and the sight has been long popularly recognized in the name of "eye-teeth" given to the canines, and this seems to depend on no popular superstition, but on a real scientific fact. It is believed by many that the extraction or decay of a canine leads to loss of sight, or inflammation in the corresponding eye, and the physiological experiments of Magendie and Schiff substantiate this belief.

Magendie divided the inferior maxillary branch of the fifth, and Schiff divided the lingual and inferior dental branches without injury to the ophthalmic branches.* The dimness of vision produced by these

* Magendie, in 1838, showed in one of his lectures a small dog in which he had divided the inferior maxillary branch of the fifth nerve some time previously. "Hitherto," he said, "only those parts were affected to which the branch was distributed; but in the present instance disturbances of the visual power had appeared some days ago. There was no such opacity as that which follows section of the fifth pair of nerves in the skull, but only a little cloudiness between the lamellæ of the cornea. Their transparency was not completely lost, but there was a condition intermediate between complete transparency and commencing opacity. It appeared to him, also, that the sensibility of the eyes was somewhat altered. When engaged in another research, I have divided, in a number of dogs, sometimes the lingual branch alone, and sometimes the inferior dental branch, high up at the point where it branches off from the inferior maxillary nerve. Since here the nerve was exposed and divided outside the skull, neither injury nor compression of the ophthalmic branch is to be thought of. No doubt, by my method of operation, traction was exerted on the inferior maxillary branch which was seized by the forceps; but the traction was exerted rather against the periphery than the center, the dental branch being partly drawn out of its canal in the lower jaw. In most of the animals operated on nothing remarkable was to be seen, but in about a third of them (four out of eleven) an affection of the corresponding eye appeared from four to eight days after the operation, without my being able to discover any reason for this peculiarity in the way in which the operation had been performed. The conjunctiva became injected, and the injection went on increasing for two or three days, but never became so great as it does after division of the trigeminus. The eye was moist, and covered with a thin layer of the same mucus which is secreted so abundantly after paralysis of the ophthalmic nerve. The cornea did not become opaque, but exhibited a partial grayish dimness, which extended from the center in irregular form, to a varying extent, sometimes towards the upper and sometimes towards the under edge. The eye exhibited no perceptible diminution of sensibility; the pupil remained perfectly mobile, and exhibited all the usual synergetic contractions on movement of the eyeball.

"The dimness of the cornea increased for a short time, and in about twelve days from its commencement it disappeared completely, leaving the eye perfectly normal. During all this time the animals were perfectly lively, and their general condition underwent no change.

experiments is referred by Schiff to disturbance of the vaso-motor supply to the eye, consequent upon a partial paralysis of the ophthalmic branch of the fifth; but as this nerve itself was not injured in the experiment, it is evident that the vascular alterations are of reflex origin, the irritation having been conveyed from the site of the wound to the nerve-centers, and having there exerted such an influence upon them as to induce vascular changes in the eye.

The eyelid may also be affected reflexly from the teeth. Sometimes dental irritation may cause motor spasm, and at other times paralysis. A year or two ago I had the stump of a bicuspid tooth extracted from the right upper jaw. Almost immediately after the extraction I noticed a constant spasmodic twitching in the right eyelid, which I was utterly unable to restrain. This lasted all the time the wound in the gum caused by the extraction of the stump was open, but it ceased as soon as the gum had healed, and has never since returned. A case is recorded by Gaine* in which a carious tooth of the upper jaw had caused an abscess in the antrum. The right upper lid was paralyzed, the pupil dilated, and there was no reaction. The optic nerve was pale, and the eye blind. On extraction of the

"On what do these peculiar phenomena depend? Certainly on the weakening of the vaso-motor nerves in the district supplied by the ophthalmic nerve. But, as this nerve itself was not touched, some pathological process must needs have been propagated from the wound of the third branch towards the center, and there have extended over the original district of that branch. This very general conclusion appears to me well grounded; for I cannot believe that in these cases the hyperæmia of the eye on the side operated upon was due to chance, for this affection of the eye never occurred in any one of the numerous dogs which I kept under observation after other operations. The ophthalmic nerve here was not paralyzed, for the phenomena were not very intense, and the sensitiveness of the eye had not suffered.

"The explanation of this was all the more obscure, as I had previously convinced myself that no pathological changes could be discovered by the microscope in the central end of the divided nerve. Besides, I had performed the same operation on the third branch of the trigeminus in a great number of cats, and no affection of the eye occurred in them. I therefore utilized the opportunity of studying more carefully the anatomical changes which are associated with this transitory condition, which was afforded me in 1852 by two young dogs, which exhibited this dimness of the cornea after resection of the inferior dental nerve. The dogs were killed from six to ten days after resection of the nerve. The swelling and alteration of the divided end of the nerve were no greater than is usually the case after such resections. There was, as usual, an exudation of nucleated globules between the nerve bundles in the neighborhood of the wound. Neither the inferior maxillary, higher up, nor the ophthalmic exhibited anything abnormal under the microscope. A slight redness of the coverings of the nerve immediately below the exit of the third branch from the cranium could only be regarded as accidental, and perhaps due to the traction on the nerve-trunk during the operation—and all the more as this redness was greater in the animal killed on the sixth day after the resection, and in which the dimness of the eye was less than in the dog killed on the tenth day. In both animals it appeared to me that within the cranium the arachnoid covering the pons on the operated side, as well as the pons itself at the root of the fifth nerve, were more injected than on the corresponding parts of the other side. But any one who knows how inconstant and variable is the amount of blood inside the cranium will excuse me when I state this with considerable reserve. Both animals were killed with strychnine."—Schiff, *Untersuchungen zur Physiologie des Nervensystems mit Berücksichtigung der Pathologie*. Frankfort, 1855, p. 112.

* Gaine, Brit. Med. Journ., Dec. 30, 1865.

tooth and puncture of the antrum the paralysis of the lid disappeared, although the eye did not regain sight.

Spasmodic contraction of the masseters is another consequence of dental irritation. A few weeks ago a gentleman, over forty years of age, called upon me and told me that he was much concerned about a spasmodic affection of the jaw from which he was suffering. He was, in fact, afraid of lock-jaw. He felt obliged to keep his mouth open, because it seemed to him that if he once shut it he would not be able to open it again. I did not recollect having read any description of this affection, but it seemed evident that it must depend either upon congestion of the cerebral center for the movement of the jaw, which Ferrier locates at the lower end of the fissure of Rolando, or on reflex irritation from the mouth itself. The latter seemed to be much the more probable, and on looking into his mouth I saw that the teeth did not seem to be altogether in good order. I accordingly requested him to see a dentist, and, on inspection, the source of irritation was discovered to be a wisdom-tooth which was just making its way through the gum, but in a somewhat oblique direction, so that its crown was pressed against that of the molar in front of it. On looking up the literature of the subject, I discovered that this affection was pretty fully described by Germain,* who recognized two causes for this form of trismus. The first is when the back molar is decayed, and a gumboil forms at its base, and the other is when the attachment of the masseter extends in front of the angle of the lower jaw, and the wisdom-tooth, in appearing, must break through its muscular and fibrous attachment. Colin states that every year he sees at least one perfectly healthy individual become suddenly affected with spasmodic contraction of the masseters. There is no fever, but the contraction is so strong that only fluid nourishment can be taken. The contraction can be felt by running the finger over the masseter muscle. It gradually disappears in about eight or fourteen days. Little treatment is required except attention to the bowels, and possibly, if the contraction be very severe, an injection of atropia into the muscular substance itself might be of service.

We have already noticed paralysis of the eyelid as a consequence of dental irritation, and we have also discussed the pathology of temporal and occipital headache in relation to caries of the teeth. Sometimes, however, paralysis occurs of a much more extensive character, in consequence of dental irritation, especially in children. Teething is recognized by Romberg and Henoch† as a frequent cause of paralysis appearing in children without any apparent cause. According to Fliess,‡ paralysis of this sort occurs more commonly during the period of second dentition, whereas convulsions generally occur during the first. Its onset is sudden. The child is apparently in good health, but at night it sleeps restlessly, and is a little feverish. Next morning the arm, or more rarely the leg, is paralyzed. The arm drops; it is warm but swollen, and of a reddish-blue color. It is quite immovable, but the child suffers little or no pain. Not infrequently paralysis is preceded by choreic movements. Sometimes

* Germain, *Gaz. Hebd.*, 1863, x. 7.

† Colin, *Études Cliniques de Médecine Militaire*.

‡ *Klinische Wahrnehmungen und Beobachtungen*.

recovery is rapid, but at other times the limb atrophies, and the paralysis may become associated with symptoms indicating more extensive disturbance of the spinal cord and brain, such as difficulty of breathing, asthma, palpitation, distortion of the face, and squint, ending in coma and death.

It is only in very rare instances that we are able to gain any insight into the pathological anatomy of such cases, because they rarely prove fatal, and even when they do so the secondary changes are generally so considerable as to leave one in doubt as to the exact mode of commencement. This renders all the more valuable the case recorded by Fliess,* in which a boy five years old, and apparently quite healthy, found his left arm completely paralyzed on awaking one morning after a restless night. The arm was red, but the boy suffered no pain, and played about without paying much attention to the arm. The same day he fell from a wagon upon his head, and died in a few hours. Apart from the fracture of the skull which caused his death, the anatomical appearances which were found were congestion of the spinal cord near the point of origin of the brachial nerves; the meninges were here much reddened and congested; the veins were much fuller than on the corresponding right side. There was no organic change perceptible, either in the spinal cord or in the brachial nerves. On the other hand, the turgescence of the veins extended from the shoulder and neck up to the face, and was very striking in the sub-maxillary region.

This vascular congestion seems to point to vaso-motor disturbance of a somewhat similar kind to that which we have already noticed in connection with occipital headache, or with migraine accompanied by subjective appearances of either form or color. Choreic movements, as we have said, have been noticed as prodromata of paralysis, and occasionally dental irritation may give rise to chorea alone. This irritation may depend, according to Levick,† either upon the second dentition or upon dental caries, and the causal connection between the two is shown by the fact of its disappearing when the tooth pierces the gum, or when the carious teeth are extracted.

According to Russell Reynolds,‡ the second dentition is also a cause of epilepsy, and he has observed that those who are affected by it have often suffered from convulsions during the first dentition. A case is recorded by Albrecht§ of a boy, aged twelve, who suffered daily for twelve months from general convulsions, which began in the temporal region and extended to the external auditory meatus. There was no decay in this instance, but the teeth were large, and the last molar on the right side had its crown jammed into the ascending ramus of the jaw. As soon as it was extracted the pain ceased, and the convulsions did not return. Another case is given by Mr. Castle|| of a young man, aged nineteen, who had complained for four years of headache and pain in the eyes, stiff neck, swelling, and numbness of the right arm. For the latter two years he suffered

* Fliess, *Journ. der Kinderkr.*, 1849, July and August.

† Levick, *Amer. Journ. of Med. Sciences*, Jan. 1862, p. 40.

‡ Russell Reynolds, *Lancet*, July, 1848.

§ Albrecht, *Casper's Wochenschr.*, 1837.

|| Castle, *Lancet*, Jan. 1848.

from general convulsions, which came on every two or three days, ending with vomiting, and often succeeded by partial deafness. All treatment was useless, and setons and blisters to the neck did no good. Nearly all the teeth were decayed; nine were extracted, and almost all of them had matter at their roots. A gargle was given, with five grains of iodide of mercury twice a day, and a purgative twice a week. After the extraction of the teeth the fits entirely disappeared.

Affections of the intestinal track depending on dental irritation are of very considerable importance indeed. The diarrhœa which comes on in children during dentition is well known, and is probably of a reflex character.

In adults many a case of dyspepsia is due to defective teeth, partly, it may be, from reflex affection of the nerves, both secretory and motor, of the stomach and intestines, but partly also, without doubt, from the imperfect mastication of the food, which is swallowed without being broken up on account of the pain or inconvenience which the act of mastication causes. In this way two evils are occasioned. First of all, the shortened sojourn of the food in the mouth allows no time for the secretion of saliva. From want of this the starchy constituents of the food are imperfectly digested; and, moreover, deficiency of saliva also lessens the normal stimulus to the secretion of the gastric juice; for alkaline fluids, like saliva, stimulate the secretion from the stomach, and this deficiency of saliva is accordingly followed by a deficiency of the gastric juice. But, secondly, imperfect mastication has a mechanical action in preventing perfect digestion, for the food, being swallowed in lumps, is not permeated by the digestive fluids, and thus cannot be dissolved in anything like the same period of time that it would otherwise be. The diarrhœa which occurs in children is probably produced through the gastric and intestinal branches of the vagus, and other branches of this nerve may be affected reflexly from the teeth. In a case recorded by Lederer,* the second left upper incisor was replaced in a young girl by an artificial tooth. Shortly afterwards she became ill, vomited everything, and suffered from convulsions. No remedy succeeded until the tooth was removed and shortened. Immediately all the symptoms from which she had suffered disappeared.

The close connection between the roots of the fifth nerve and those of the vagus can be demonstrated anatomically, and it is probably in consequence of this that irritation of the fifth is able to exert such a powerful influence upon the circulation. Some time ago, in a paper which I published in the *British Medical Journal*, I mentioned that the cause of death during the extraction of teeth under chloroform was probably the stoppage of the heart's action through the inhibitory fibers of the vagus, associated with a reflex depression of tone in the blood-vessels. The reason why the extraction of a tooth in a person who is not under the influence of an anæsthetic is followed by no ill effects is probably this: that in him the irritation of the fifth nerve produces two distinct actions which counterbalance each other. It may cause reflex stoppage of the heart through the vagus; but at the same time it causes reflex contraction of the vessels

* Lederer, *Wien. Med. Presse*, vii. 24, 1866.

through the vaso-motor center. This contraction of the vessels maintains the pressure in the arterial system during the stoppage of the heart, and thus no harm whatever is done. When an anæsthetic is used, however, one of these pieces of nervous mechanism may be paralyzed by it, while the other is not, and thus the extraction of the tooth may stop the heart without causing contraction of the vessels. The blood-pressure will then sink very rapidly in the arterial system, and fatal syncope may be produced. If, however, the anæsthetic be pushed to a greater extent, so that both parts of the nervous mechanism just mentioned are paralyzed, the vessels are not contracted, but neither is the heart stopped. The operation is therefore comparatively free from danger when no anæsthetic has been given, or when the anæsthesia is perfectly complete, the period of danger being that of imperfect anæsthesia.

We have now seen how affections of sensation, of motion, and of nutrition may all be dependent upon dental irritation, but even the cerebral faculties themselves may also suffer from a similar cause. One or two very interesting cases of this sort are recorded by Dr. Savage in the *Practitioner* for June, 1876. The first of these was that of a farmer, aged twenty-two, with a strong family tendency to insanity. In May, 1875, he suddenly took to riding madly about the country without his coat and waistcoat. From May until November he was exceedingly noisy, destructive, untidy, almost constantly excited, and if for a day or two he was exhausted, he was sullen and more dangerous. In the middle of November he complained of very severe toothache that caused him to be sleepless. He bore this for two or three days, after which the stump was removed. There was suppuration at the end of the root. From the time that the stump was extracted the patient steadily improved, and by the middle of December was quite well. Another case was that of a woman, aged thirty-four, who had a brother insane, and had herself been intemperate. She was admitted in September, 1875, suffering from acute mania. She was noisy, violent, and obscene. She continued to be so until January 20, 1876, when she complained of great pain, with swelling and redness of her right lower maxilla. She had some bad teeth, but did not complain of toothache. The pain and swelling increased, and at the same time she became quiet and reasonable. She said she could not remember much of her state of excitement. The swelling of her face subsided, and she remained quite well. This case, however, was not so convincing as the first one recorded, because here there was a second possible cause of recovery, as she was pregnant, and said she felt quickening about ten days before her recovery. The recovery, however, was coincident with the pain and swelling of the face, and seemed rather than the quickening to be the cause of recovery.—*T. Lauder Brunton, M.D., F.R.S., in Transactions Odontological Society of Great Britain.*

ON CONTRACTIONS OF THE MOUTH.—The president (E. D. Mapother, M.D., President Royal College of Surgeons, etc.) read a paper on "Contractions of the Mouth and Jaws," as follows:

During the past three months cases of contraction of the jaws and oral aperture have occurred to me which may interest the society, especially the first, which relates to the branch of surgery lately affiliated with our college.

A lady aged twenty-four, married, and mother of one child, consulted me for closure of the jaws, which had been increasing for eighteen months from March, 1878. Then there had been toothache of the second and third left inferior molars, but no abscess or other inflammatory condition. The central incisors could be only separated for two lines, and any attempt to force them apart caused severe stretching pain. Speech was very imperfect, and for months she had been fed with fluids sucked from the point of a teaspoon. She was therefore weakly because underfed. The left masseter felt through the skin very hard, and its anterior border, examined through the mucous membrane, was extremely rigid. The right muscle was softer, but also in tonic spasm.

As antispasmodics had been fully tried by two leading physicians, and as further closure to the total exclusion of food was dreaded, I urged examination during anæsthesia, and the aid of Mr. Baker, F.R.C.S., was procured. When etherization was complete the jaws could be fully separated, and the dilators we had ready were not needed. They were of the kind invented by the late Mr. Maunder—a boxwood cone with a spiral groove, just like the *Rostellaria* shell—and the steel two-bladed one. Mr. Baker extracted the wisdom-tooth, which was impacted in the root of the coronoid process and the second molar, which it had displaced and diseased. For a few days there was soreness in moving the jaws. Last week I saw that she could fully enjoy a yawn, and that having chewed solids her health greatly improved.

The Americans term this disease *trismus dentium*, and the words *sapientie inferiorum* may with exactness be added, for it is these teeth alone which excite it. The upper wisdom-teeth can make room towards the tuber or antrum, but the coronoid process is less yielding when eruption is hindered by crowding of the teeth owing to want of growth backwards of the ramus. At the age of six years the sacs of the lower wisdom-teeth appear, and at twelve calcify in the middle of the coronoid process. It is quite common for teeth to remain half erupted, and covered by a flap of gum, which causes much pain in mastication, and leads to caries, as noted in John Hunter's great work on the teeth (1778), which constitutes him the father of dental pathology. Malposition of these teeth has produced pharyngeal and sub-facial abscesses so severe as to threaten life, and connective-nerve symptoms like aphonia and amaurosis. They lie so close to the inferior dental nerve that it has been torn during their extraction. The great size of this nerve, and its close connection with the twigs to the masticatory muscles, explain spasms of them, especially as their antagonists, the muscles which open the mouth, are weak and indirect in action.

It is reported that metal stoppings, especially those of both the positive and negative conditions, have excited electrical trismus of the masseter. Dr. G. Johnson relates that a grain of flint lodged for fourteen days in a scar in the cheek caused trismus and, what seems inexplicable, palsy of the seventh. Allusion may be made to other causes of trismus: The buccal, mainly a sensitive nerve, forming a plexus with the facial; epilepsy in this case had recurred after a lapse of twelve years, but removal of the irritant cured all. Barwell found it unilateral from a temporal wound, and with the peculiarity of re-

laxation during sleep. The literature of trismus nascentium is so familiar that I will only remark that tetanus, spasm of other muscles, supervenes if the infant lives long enough, and that some of its assigned causes could act through the cutaneous branches and the inferior maxillary division of the fifth nerve. Cold to the face, the only exposed part, chill after very hot baths—causes said to have respectively produced the great Iceland and Vienna epidemics—might be thus regarded. The foul air pent up in the rotunda one hundred years ago, and the effluvia from filth round negro babies, would act on the eighth nerve, and pressure of the occipital bone during parturition upon the respiratory nerve-centre, as urged by Marion Sims, would lead to spasm of the muscles of the mouth, pharynx, and chest. Causation by inflammation about the navel, as assigned by A. Colles, is beyond neurological speculation.

The treatment in my case was simple and effectual, yet by some gradual separation by means of a wedge, or of Cattlin's rack and pinion separator, is preferred; and the masseter has been subcutaneously divided in one instance, the closure being so extreme that the patient had to put the lips into fluid food and suck up like a pig. In another case the digastric, a weak antagonist, has been excited by galvanic needles stuck into it.

It is rash to point a moral from a single case, but I believe most serious troubles could be avoided by the diagnostic power which a course of lectures on dental pathology would confer on every member of our profession.

Stomato-plasty.—Last October a countryman, aged thirty, otherwise healthy, was sent by Dr. Lyster, of Athlone, to St. Vincent's for contraction of the oral and nasal openings, the result of lupus, which had cicatrized two years before with horrible deformity. The left nasal opening was wholly closed with a thick scar, and in the right there was a passage through which he daily forced a piece of wood the size of a No. 2 catheter. He refused all interference with the nostrils, as he said that by the use of caustics the contractions had been made worse. The oral aperture was a perfect circle of six lines in diameter, with healthy lip-tissue at the upper and lower thirds, but with hard cicatricial structure at the commissures. It was scarcely dilatable, and examination of the mucous surface with the little finger caused much difficulty of breathing. Speech was very imperfect, and he had been restricted to fluid diet for months. As he begged for the least severe operation, a plan was followed which I have found useful in dealing with cicatricial webs after burns of the elbow and neck. In each cheek, six lines from the strictured mouth, a perforation was made with a platinum rod, two lines in diameter, heated to whiteness by the benzole apparatus. The buccal cavity was protected by a wooden spatula. Mr. Morrison, F.R.C.S.I., has made such holes with Chassaignac's trocar, and kept them open with a drainage-tube acting like a seton. In five days the sloughs came out, leaving holes apparently too large. They quickly contracted to a size less than the platinum rod, and in a month were healed, with smooth flexible tissue, which seemed as likely to be permanent as the perforation in a lady's ear. Then the intervening pieces were removed by incisions from the upper and lower edges of the holes to the mouth. On the left side the cheek was found very

thick, and at the suggestion of my colleague, Mr. O'Leary, I followed the plan of Serre, of Montpellier, and took out a wedge-shaped bit of each cut surface from between the skin and mucous membrane, which were then sutured. In four days the surface of the right aperture ulcerated, and contraction ensued till the plan on that side was a failure. The patient and I were fairly content with the left operation, which widened the mouth by some three lines, but on the right (December 9) I performed Dieffenbach's stomato-plasty. I find that Werneck adopted this procedure in 1817,—thirteen years before the great master just named.

Anæsthesia was not attempted on this or the former occasion, as the breath inlet was so narrow. The left forefinger being passed towards the mucous surface, incisions were carried from a point ten lines external to the commissure to the upper and lower edges of the mouth. They went only to the depth of the submucous tissue, and to this level the triangular piece was dissected off. The labial portion of the orbicular muscle was cut away, for its sphincter action seemed to promote the persisting contraction. The superior coronary artery being divided was twisted. The mucous membrane, made tense by lowering the jaw, was cut horizontally to within two lines of the angle, with a scissors, and the flaps were stitched to the edges of the skin. But for the difficulty of breathing, I would have followed Velpeau's plan of inserting the sutures before dividing the mucous membrane. Towards the new commissure the flaps were very narrow, but to get them wider would have required incisions beyond the level of the healthy lips. The jaw was bound up with a roller. All was fairly healing by the fourth day; the sutures were removed, and a mouth-stretcher, or tubular obturator, similar to that figured in Garretson's "Oral Surgery," but made of gutta-percha, was put in. The gutter all round kept it fixed, and the opening in it was much larger than the mouth before operation. He wore it very perseveringly, only removing it when feeding. On Christmas-eve, when he insisted on going home,—some eighty miles,—the mouth measured transversely sixteen lines, and when opened to the utmost fourteen lines from above downwards. Its greater extent to the right side was not very unsightly, and it will probably lessen. The newly-formed lips had a fair red color. During treatment the surface of the scar got abraded in several points, yet no lupoid ulceration recommenced, because the sebaceous glands, in which that process has its site, had all been destroyed.

Mr. Baker had little to add to the case which had been brought before the society by the president, and with which his name had been associated. With all deference, however, he must differ with Dr. Mapother as to the cause of the muscular spasm in this case. He did not think it was due to impaction of the wisdom-tooth, but to "contiguous irritation." The wisdom-tooth was perfectly erupted and standing well in front of the coronoid process. Both the wisdom-tooth and the second molar were extensively diseased, and their roots showed evidence of long-standing chronic inflammation. The periosteum was considerably thickened, and almost cartilaginous in its consistence. In cases of this kind, after the removal of the teeth which were the source of irritation, there was generally a recurrence of the spasm in an aggravated form, consequent on the increased irri-

tation from the operation. This state of things soon subsided, and eventuated in a satisfactory cure. The instrument used to separate the jaws in this case was Fergusson's double-lever gag; the teeth were removed with a slightly curved elevator.

Mr. Robert McDonnell said he had had recently under his care in Steevens's Hospital a case so closely similar to the second that he really thought it was the same until he found that Dr. Mapother's was a male, while his own was a female. His was a frightful case, in which the face had been almost entirely devoured away; and the mouth, which was kept open by a crow's quill, had reduced so that he could barely insert his little finger. In fact, she was able to take food so badly that she was dying for want of nutriment. She had been operated on by dilating the mouth, which resulted in her being rather in a worse position than before. There was no mucous membrane existing on the inside of the lips. He did not think the case was suitable for the operation Dr. Mapother had alluded to, and he contented himself with a very simple proceeding, which, owing to the assiduity and ingenuity of the resident pupil (Mr. Isdill), turned out very well, and the patient went away greatly improved. He slit the mouth across very widely and put in silver sutures, but they were absolutely of no use. After a few days it was difficult to prevent it from healing. The resident pupil then made silver-wire hooks and fastened them with an India-rubber strap behind. However, the patient endured them and went home again very imperfectly cured, but still with a much better mouth than she had when she came to town. The first case was extremely interesting. It recalled a remarkable case of closure of the jaws,—that of a gentleman who was wounded in the shoulder in India, the head of the humerus being injured. On his way home, by the Cape of Good Hope, his jaws began to close, closing gradually and steadily with occasional relaxations sometimes for a few days. The ball had remained lodged about the shoulder-joint. In London he consulted Sir William Fergusson, and having been placed under the influence of an anæsthetic, an attempt was made, but without success, to get out the ball. Irritation of the circumflex nerve probably gave rise to the symptoms. Coming to Dublin some time afterwards, he was under his (Mr. McDonnell's) care and that of the late Mr. L'Estrange. They succeeded in opening his mouth with dilators, so that he was able to eat solid food carefully minced. Still, no treatment could reduce the irritation, for which they could discover no other cause than the injury mentioned. By a surgeon in London he had been placed under a severe mercurial course, under the supposition that neuritis was the cause. As the result, the anterior part of the alveolus became carious. The trouble of putting in food produced a tenderness which gave rise to necrosis of the front of the jaw. However, by this treatment he obtained a sufficiently good opening to eat with. Subsequently he returned to India and died in the course of some years, having never recovered the trismus.

Dr. Stack said the two cases brought forward were of extreme interest both to the general and the special surgeon. The former of the two, that which was concerned with the wisdom-tooth, was the one on which he would make one or two remarks: The cause of the stiffness of the jaw in this and similar cases seemed to be either

a spasmodic contraction of the masseter muscle or an interference with its power of relaxation, due to an infiltration of the products of inflammation into or around its sheath. In the case in question the former appeared to have been the condition of the muscle, because, under ether, the tension relaxed and the jaws were able to be separated rapidly by the gag. If the stiffness of the jaw in any such case were due to the presence of inflammatory products, rapid separation of the jaws either with or without an anæsthetic would be impossible; or, if possible, could only take place after such rending and laceration of the tissues by the forcible distention as would render such an attempt very unadvisable. As regards the wounding of a nerve in operations on the wisdom-teeth, it seems to him that the gustatory nerve was in more danger of being wounded in such operation than the inferior dental.

Mr. Stokes said he himself had performed the operations of Serrè with good results; but he was not aware that the same mode of treatment had ever been adopted before in the class of cases detailed, and it would be particularly interesting hereafter to see whether the result would be as satisfactory as it was at present. In his operation he found while relief was given there was a tendency to recontraction to a certain extent, and Dr. Mapother's would be interesting in enabling him to compare the two classes of cases in the same individual.

Mr. Croly had met with several cases of abscess connected with the wisdom-teeth, to which his attention was first directed by the late Professor Geoghegan, who was in the habit of making incisions, giving instant relief. Within the last few weeks, from a licentiate of that college, he received a letter requesting a visit, as he was suffering from tonsillitis and almost starved. He saw him. Looking into his mouth, disclosing a very peculiar V-shaped palate, he found the tonsils free, and he then pressed over the last wisdom-tooth of the left side of lower jaw, and making a free incision gave him instant relief. About a fortnight afterwards he was attacked with acute inflammation over the situation of the wisdom-tooth, and then he got an attack which he thought was tonsillitis. There was great difficulty in looking into his mouth at all—his teeth were almost locked. In a chink between the teeth matter had formed, which originated in the inflammation in connection with the wisdom-teeth. Through that chink he got in a bistoury and made an incision, which gave great relief. Since then he had consulted Mr. Sherlock, who was present.

Mr. Sherlock said the patient sent him by Mr. Croly was quite well and could open his jaws sufficiently wide to take solid food, but the tooth was not removed. He thought the irritation was caused by the second molar tooth rather than by the wisdom-tooth. However, the patient declined to have either removed, as he was quite relieved at present.

The president acknowledged the very important information that had been contributed on the subject, especially by the members of the dental profession, and he at once yielded to Mr. Baker's superior knowledge with regard to the dental pathology. At the same time in the case in question there had been no inflammatory action, nothing like effusion of lymph, round the masseter muscle. It seemed to be as pure a case of reflex spasm of the masseter muscle as could be

conceived. Immediately after the extraction the alveolus of the wisdom-teeth was fairly in front of the coronoid process. The impaction of the third molar in the root of the coronoid process was usually the cause of *trismus dentium*. On looking at the skull of a child, æt. four and a half years, where its first molar lay under the root of the coronoid process, its impaction in that position caused many of the troubles that he had detailed. In the details given by Mr. McDonnell he was much interested, and he recognized the extreme difficulty there was from the condition of the mucous membrane, and where the two holes had failed. But his own case was particularly trying from the difficulty of examining the oral aperture, owing to the closing of the two nostrils. At each attempt the man got blue in the face, so that he could never make any examination of the mucous membrane. He was much pleased at the suggestion made about the hooks pulling back the new commissure. A good deal of the persistent action depended on the sphincter-like action of the orbicularis oris muscle. He had alluded to the absence of infiltration or other inflammatory condition in his case. With regard to the anatomy of the inferior dental nerve, that nerve was more in the way in the extraction of a wisdom-tooth than the gustatory, and more likely to be injured. No tugging force from above would rupture the gustatory nerve. Rupture was recorded by Mr. Salter; it occurred in the person of a German baron. The moment the nerve was ruptured he exclaimed that his jaw was torn away. The inferior dental nerve having been torn, the nerve was rendered quite anæsthetic. Mr. Stokes's observations were thoroughly sagacious, and he would promise, if the society felt interested, to record any further observations in the case. Dr. Lyster, of Athlone, had informed him that the man had a mouth as large as when he left hospital, but he was persistently wearing the tubular dilator. In reference to Mr. Croly's observation, the case they had been discussing was not one of closure of the jaws through abscess, but was a pure case of spasm of the masseter muscle by reflex irritation of the inferior dental nerve.—*Transactions Surgical Society of Ireland, in Medical Press and Circular.*

TOOTH-CARIES OF PREGNANCY—ITS CAUSE AND TREATMENT.—It is a well-known fact that during pregnancy women are often subject to more or less annoyance and discomfort from their teeth. This disturbance may vary in degree, from a slight uneasiness—a mere consciousness on the part of the individual of the presence of teeth in her mouth—to the severest form of odontalgia, involving several teeth. The frequent occurrence of rapid and extensive destruction of tooth-structure during pregnancy is so well recognized that it would be useless to multiply examples: one case will serve to illustrate. Mrs. J. presented herself for examination of her teeth. She gave the following history. Up to the time of her marriage the teeth had been of good quality, rarely requiring the services of a dentist. During the three years following marriage she gave birth to two children; she also suffered much from toothache, and had two of her teeth extracted. After the birth of her second child she placed herself under the care of a dentist in a neighboring city, who put her mouth in order; he being a thorough and conscientious operator, the work was well done.

Again she became pregnant, suffering as before with her teeth;

some of the fillings dropped out, and a number of new cavities appeared. It was after the birth of this her third child that she came under my charge. On examination, I found the teeth very sensitive, and so soft that they could be cut away almost like chalk. The decayed portions were of that peculiar cartilaginous character which indicates a loss of the mineral portions of the tooth. I filled, in all, seventeen cavities, some large, others small, and extracted the root of one tooth too far gone to be of service in sustaining an artificial crown.

This case is a typical one, and illustrates well a class of cases that calls for a large share of the dentist's attention. In those cases where women have borne children rapidly, it is the common story that up to the time of marriage the teeth were of good quality and gave but little trouble, but since have rapidly failed.

As to the cause of this degeneration of tooth-structure during pregnancy, there is little reason to question the accepted explanation that an excessive demand is made upon the system of the mother for the lime-salts necessary to the formation of the osseous structures of the fœtus, and the teeth of the mother suffer, along with her osseous system, in meeting this demand when the supply of lime-salts is not sufficiently kept up in her food.

We believe that much can be done to avert this wholesale destruction of the teeth, the loss of which entails so much disfigurement and physical suffering. If the cause be as stated, then to supply food rich in lime combinations is the rational indication. But most of the food brought to our tables is not rich in bone-forming material, and it may be that even a liberal supply of lime-containing food would not meet the urgent demands made during pregnancy upon a system already poor in lime-salts: certainly the judicious use of some of the soluble preparations of lime, such as the lactophosphate or hypophosphite, would be of benefit in such a case, not only in maintaining the lime standard of the mother, but also in insuring to the fœtus a well-developed osseous and dental organization. We have every reason to believe that rickets is due to lime-starvation on the part of the mother and child; and evidence is not wanting to show that certain malformations of the jaws, and consequent irregularities of the teeth, are in a measure due to the lack of sufficient bone-forming material during fœtal development.

A fact in this connection which I have had occasion to observe is, that in many pregnant women the morbid craving, so called, for unusual articles of food—which is so often present and may occasion great annoyance to both patient and physician—is for articles of a mineral character, as chalk, slate-pencils, lime, plaster, whiting, etc.

Two cases in particular have come under my notice. In the first case the woman would mix a saucerful of whiting and water, which she kept near her during the day, and would eat large quantities of it with evident relish.

In the other case the lady stated that during her pregnancies her longing for lime was so great that she would almost have to run past a mortar-bed in the street lest the desire to stop and eat portions of it should overcome her. When at home, she would pick particles of plaster and whitewash from the wall and eat them greedily.

It seems reasonable to believe that this craving is nothing more

than nature's method of expressing the need for lime-salts when, from pregnancy or other causes, the supply is not equal to the demand and the system is poor in lime as a consequence. I say from other causes; for what else is it that will make a rapidly-growing, overworked school-girl chew her slate-pencils and lead-pencils with such apparent relish?

If all this be true, then the treatment before indicated of supplying to the system all the lime it needs, either by properly selected food, or, if occasion demands it, by the administration of a sufficient quantity of some soluble preparation of lime, ought to do much towards averting the destruction of the teeth by caries during pregnancy, and towards relieving the distressing cravings for unusual kinds of food incident to that period. As having bearing upon the subject and showing that an increased amount of lime is demanded by the system during pregnancy, I may cite the fondness which birds and fowls generally have for lime, oyster-shells, plaster, etc., during the egg-laying period. Another point which I have noted is that this fondness for lime is displayed on the part of the female more than on that of the male: hens will quarrel for the possession of an empty egg-shell, and the cock will look on without interest while they devour it greedily.

The effect of an insufficient supply of lime is seen sometimes in the case of caged birds, as canaries. If they are not supplied with cuttle-fish bone during the breeding-season, the eggs will be laid without shells, or with shells so thin that they will not withstand the slightest touch. This same result takes place with hens that are cooped for a length of time and are not supplied with a proper quantity of lime-containing food. Is not the desire for lime shown by these animals analogous to the craving so often exhibited by pregnant women for like substances? It is true the craving does not in every instance take the form of a desire for lime; but nevertheless it is probably only an expression of the same need lacking proper direction.

The system makes demands for what it needs in a way there is no mistaking. At times we crave acids, and we indulge freely in pickles, acid fruits, etc. At other times sugar or salt is needed, and we eat accordingly.

This is further illustrated by the long pilgrimages made by the buffaloes and antelopes of our western territory to the salt-licks, in order to satisfy their instinctive demands for salt.

The rapid destruction of teeth during pregnancy, and the therapeutic measures suggested by the so-called morbid cravings, are of equal importance to physician and dentist.

To secure for the overtaxed child-bearing woman immunity from much pain, nervous distress, imperfect mastication, and impaired digestion, by the preservation of her teeth, cannot be considered a trivial matter.

As the sphere of the dentist to-day is limited in a great measure to the repair of injuries already sustained by the teeth, we must look to the members of the medical profession to aid us in answering the question, How much in the way of preventing the decay and loss of the teeth from pregnancy can be accomplished by supplying to the system all the lime it needs during the gestative period?—*Edward C. Kirk, D.D.S., in Philadelphia Medical Times.*

THE DENTAL PROFESSION IN FRANCE.—We are glad to see that at last there seems a fair prospect of an improvement in the dental branch of the profession in France. It has long been a matter of wonder why in a country where the education and status of the medical profession generally leave little of serious importance to be desired, dentistry has always been ignored by medical authorities, and has been relegated by common consent into the hands of charlatans. The number of dentists in France holding a diploma indicating professional education is extremely small, and this number is mainly composed of foreigners,—Englishmen and Americans. We also believe that there is no school of dentistry in France, and lectures or instruction on the subject are, as a rule, not provided at the medical schools or hospitals. Thanks to the efforts, in the first place, of Dr. Mordaunt Stevens, of Paris, an old student of the Dental Hospital of London, this deplorable state of things appears likely now to undergo a change for the better. A society has been formed, styled “La Société Syndicale des Dentistes,” to which many of the most respectable French practitioners have united themselves, and this society will have the object of elevating the profession, of removing the abuses which exist, and of placing dentistry in France upon an improved footing, such as it has taken in this country, and which its importance to the public makes it urgently desirable it should occupy. We wish all success to this new society, and we shall watch its progress with interest and sympathy.—*Medical Press and Circular.*

HINTS AND QUERIES.

“He that questioneth much shall learn much.”—BACON.

CORRESPONDENTS desiring a reply in this department are requested to make use of *distinctive signatures or initials*, and avoid the practice of signing their communications Reader, Subscriber, etc.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names. We cannot insert queries or replies except they are so accompanied. Names not necessarily for publication.

I HAVE a patient about forty years old, who was troubled with neuralgia, caused, he thought, by a right superior central incisor, which was considerably worn. He had the tooth extracted, but finding no relief he had three others extracted, after which no further trouble was experienced, except that pus has been discharging from the socket of the central incisor. The patient by putting the finger to the extremity of the root and pressing towards the orifice can force out pus once or twice a day. The tooth (central incisor) in which all the trouble originated was extracted by a rather rough operator, and too much of an inward and outward motion may have been used in its extraction, thus shattering the thin walls of the alveolus. Nearly a year has elapsed since the teeth were extracted. What is the trouble and the treatment?—URIAH.

IN July last, I had recourse to the method of extracting roots described by L. E. W. (see DENTAL COSMOS, March, 1880), which I have followed many times successfully. The case in hand was a hollow, conical root of the left superior incisor. The alveolus soon closed; three months after the operation an abscess formed close up under the lip, from which pus has discharged freely ever since.

I have used the common antiseptics, but without permanent benefit. Will some one of experience explain the cause and advise treatment? Could the abscess have formed from mechanical irritation alone, or have I possibly left a small portion of the root?—*QUERIST*.

OF late years we have frequently seen attention called to a supposed deficiency of lime-salts in the food, and the importance of increasing the supply, either by carefully selecting the food or administering the needed elements medicinally, to improve the character of the teeth. I would like to ask whether the presence of tartar, either in the hard, concrete form, or as a soft, pasty mass (both composed largely of lime-salts), is not sufficient indication that more lime is *not* needed? I wish also to ask whether those living in limestone districts, where the water is largely impregnated with lime, are any better nourished as regards the hard tissues, especially the teeth, as a result of the large supply of lime the system receives?—*CALCIUM*.

I HAVE a boy about eight years of age who has his superior central incisors overlapping at the cutting-edges. Will some one give the best method of regulating them, and oblige C. H. R?

The writer would feel grateful if some well-informed practitioner of dentistry would point out a definite course of treatment in connection with the temporary molars, particularly in cases of exposure of the pulp.—*F. F. D.*

DOES burnishing an oxychloride filling with a hot talc burnisher just after it has hardened, and before the dam is removed, materially increase its durability? If so, how, and why?—*I. D. A.*

Is there any method by which amalgam after it has once set can be softened so that it can be used again?—*W. H. P.*

ANSWER to "Rubber," "Hints and Queries" for April, 1880.—In answer to "Rubber," who asks why rubber turns dark upon being vulcanized, we suggest: The natural color of vulcanized rubber, *i.e.*, rubber mixed with sulphur and then subjected to heat, is a dark brown. In rubber prepared for dental plates, this dark brown is first toned down by mixing with the rubber a white substance not readily affected by sulphur (usually oxide of zinc), and then colored red. The natural color (that is, the color the rubber assumes when vulcanized at the most convenient heat, and for the most convenient time) varies with different makes, and with the heat employed, and the length of time the vulcanizing process is continued. It is probable that there is some action between the sulphur and the coloring matter (especially at a high heat), as we find the lower the heat used the lighter the color, and the less the change in color from over-vulcanizing. We also find that the less coloring matter there is in the rubber the less sensitive the color is to over-vulcanizing. The Bow Spring contains less coloring matter than most dental rubbers; its natural color is darker; it approaches nearer the strength and color of simple rubber and sulphur.

I would suggest to "Rubber" to test his apparatus, and while doing so to obtain a set of specimens that may have future usefulness, by vulcanizing a series of pieces of the rubber he uses, about the average thickness of plates, imbedding them in plaster in the flask. Let them all be heated up in the same time—say half an hour—to the same heat, 320°. Take the first out, say fifteen minutes before the time usually employed. Let the next have a few minutes longer, and continue the experiment until the exact condition, *i.e.*, just vulcanized enough and not too much, is reached.

The specimens, accurately labeled, will serve as a check on inaccurate thermometers, and indicate the change in time and heat needed to produce the required result. If the heat is raised any above 320° , if only for a few minutes, it injures the color; keeping it in a shorter time does not prevent this. And again, if the time consumed in reaching 320° is increased, as it should be in thick plates, and the time of vulcanizing not reduced, the piece will be overdone and darker.

Thermometers often vary as much as 10° or 20° , and as much difference may occur from the tube's not being accurately adjusted to the scale when put in, or from changing its position after it is in. The same make of rubber will also vary slightly as to the time required to vulcanize, and the color when done. We have found nothing to materially improve the color after vulcanizing.—TOBY.

REPLY TO "GRADUATE" IN MARCH DENTAL COSMOS.—If the printed instructions which accompany the electro-magnetic mallet and battery are carefully and thoroughly carried out, I cannot imagine how you can fail to succeed. I have used the little beauty almost every day (except Sundays) during the past year, and have never had a hitch that delayed me for more than a few moments. Occasionally the rod of the interrupter catches, thereby stopping the action, but a very minute quantity of oil puts that trouble to rights immediately. Once I was much perplexed by the mallet's refusing to work, without any apparent cause; I had been using it for over an hour, and laid it down for a few moments while I burnished the filling, but upon commencing a new filling I found it would not work. The battery was working, the connections all right, interrupter free,—then what was the trouble? Simply this, one set of the fine copper wires in the *silk* cord were broken close to the tube connecting them with the plugger. Having an *extra* silk cord at hand I changed it for the broken one, and soon had the little fellow buzzing away as hard as ever. Have patience and follow the printed directions carefully.—FRANK COMER, *Kingston, Jamaica, W. I.*

"QUESTIONER," in the March number, desires to know how to make a pivot firm in the root. If the root has strength to hold a pivot at all, a *metal* one is the best for any style of crown. After the crown has been fitted to its place, take a piece of gold or platinum wire of the desired length, which will fit loosely in the hole in the root. First roughen the pivot with a coarse file, then cover it with gutta-percha, taking care not to burn or overheat the gutta-percha. Have the root as dry as possible. If the opening in the root is large, sufficient gutta-percha should first be put in to fill it snugly. The pivot and crown are then to be carefully heated and the pivot forced home, the crown being held in place until the gutta-percha has been cooled by the application of cold water. If a cement is used, proceed in the same manner (except the heat and water); and if an ordinary pivot crown is used, after it has been fitted, set the pivot in the crown and in the root at the same time, while the cement is in a plastic state. Weston's Insoluble cement I find to work the best if not mixed too thick.—C. RICHARD B.

D.D.S., in "Hints and Queries" for March, wants to know what he shall do to keep rubber out of the joints in rubber work. I have tried method after method suggested by writers through "Hints and Queries," not meeting with satisfactory results with my own ideas, but have never found anything equal to the suggestion given by C. S. W. S., in No. 11 of vol. xx. It is the only *bona-fide*, absolutely certain way of keeping rubber from entering the joints when being pressed together. His idea is to cut a deep excess chamber at the back, or soft palate, part

of the model. Nothing more or less. It also answers an excellent purpose in keeping rubber from pressing under plain teeth set or ground on to the plaster model. I advise D.D.S. to try it.—W. McD.

ANSWER TO D.D.S., who asks in March DENTAL COSMOS for a remedy for dark joints caused by the penetration of rubber. I grind the joints perfectly, then bevel to a V-shape to within one-thirty-second of an inch of the face of the block, and on the corner of the stone grind longitudinally a retaining-groove; after removing the wax from the cast I fill with Agate cement, and thoroughly dry. By this means he will not be annoyed by imperfect joints after packing and vulcanizing.—F. H. B.

BEING greatly annoyed and perplexed a short time ago by the number of broken vulcanite plates (made of Bow Spring rubber, and vulcanized as per directions) which were returned to me for repairs, I set to work to find out the cause, and if possible remedy the evil in future cases. Believing that the brittleness of the vulcanite must arise from too much vulcanizing, I reduced the time at 320° from 50 minutes to 40, but could see little or no difference. I next tried 35 minutes, then 30, 25, and lastly 20 minutes. The latter, however, was a little too soft, so I went back to 25 minutes at 320°, allowing (as per directions) 15 minutes for the heat to reach 260°, and 15 to 20 minutes more to reach 320°. In this way I obtain a much tougher, stronger, more elastic, and more satisfactory plate in every way, besides saving 25 minutes' time, which in itself is frequently a very important object.—FRANK COMER, *Kingston, Jamaica, W. I.*

REPAIRING BROKEN PLASTER CASTS.—I find after various trials that the new "phosphate of zinc" is the best material for uniting broken plaster casts that I have met with in the many years of my practice. I proceed in the following manner, viz.: After mixing the composition to a creamy paste, I take the cast to be united and brush both parts with the paste, then press tightly together for a moment or two, after which I allow it to dry for an hour or more. Then I find the united cast to be capable of resisting as great an amount of pressure as before it was broken. The phosphate can also be used to supply deficiencies caused by accidental chipping or bruising.—F. HEINDSMANN.

BROMIDE OF ETHYL.—In the hope that it may prove as useful and satisfactory to others as it has to me, I wish to call the attention of those members of the profession who have not administered it to the above-named anæsthetic. I have administered it several times with the most pleasing results both to my patients and myself. My first subject was a young lady about eighteen, upon whom two unsuccessful attempts had been made with ether. She was put under the influence of bromide of ethyl, and two teeth were extracted in six minutes. There was no nausea and but slight headache on rallying.—E. C. BRYANT, D.D.S.

CORRECTION.—In the last report of the New York Odontological Society (DENTAL COSMOS, April, 1880, page 194) I find myself again misrepresented by one of the speakers, in that he refers to the Art. I. of the New Departure Creed: "In proportion as teeth *need* saving, gold is the *worst* material for saving them," as "Dr. Flagg's now famous remark." I should not in the least object to having been the author of that "famous remark," for I regard it with the highest respect as one of the *most solid* enunciations ever given to dentistry, but I could not permit one issue of the DENTAL COSMOS to pass without *again* accrediting it (as I did when I spoke it) to my friend and co-worker, Prof. Henry S. Chase.—J. FOSTER FLAGG.

THE
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ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to Act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the office of the Librarian of Congress at Washington.]

(Continued from page 232.)

BESIDES the various applications which I have thus far suggested, I cannot refrain from directing attention to the use of electricity in such cases (particularly) as are now being discussed.

The interrupted electrolytic current from a dental helix—*positive* (small sponge of the dental electrode) upon the gum over inflamed spot, *negative* (handle of electrode) in hand of patient—will usually be found of surprising efficacy; the administration need take no time from the operator, as the helix and battery-cell can be so arranged that the patient can occupy an ordinary chair instead of the operating-chair, and can at once hold the double electrode in position and regulate the current according to individual requirements, maintaining a *comfortably* strong current, increasing its strength as the capability for *easy endurance* increases. This current should be “run” for an hour or more, and repeated after an interval of four or six hours if required.

In some cases of this “third grade” of periodontitis it is found that with all the extended manipulation and medication which has been given, and with this most judiciously and accurately directed, it is impossible to effect *resolution* without resorting to yet another, and final, expedient. This is *drilling through the alveolar process into immediate proximity with the apex of the root*.

This operation is one which has been employed as a means for the prompt evacuation of *pus* in cases of *alveolar abscess* for more than

thirty years, but it must now be recognized that it is utilized for an entirely different purpose.

While upon that form of altered circulation which was given as "true inflammation," I spoke of the effusions which were concomitant with it,—of the characteristic (organizable) which especially pertained to them, and of the *intensity* of attributes which associated in this connection.

It is this complicated condition, in high degree, which we now have under consideration. We have found that the removal of the original cause of irritation has done much; that the making of that "vent" which has permitted the escape, not only of mephitic gas, but of *aggregated effusions*, has been productive of marked relief; but that notwithstanding all this, and although aided by correct adjunctive treatment, a degree of abnormality exists which precludes the termination of the inflammation by "resolution" unless decided relief is afforded to the engorged tissues.

It now becomes a question as to the method of giving this relief. The usual one is that of "stimulation" locally, to the end that "sup-puration" instead of "resolution" shall terminate inflammation.

By proper treatment, which will be given in place, this result is accomplished in a large proportion of cases with comparatively little suffering, and in a majority of instances with satisfactory promptness; but there are, occasionally, individuals who are unable to endure this somewhat protracted process, and who can only choose between almost immediate relief and the loss of the tooth.

With such, the importance of the tooth becomes a matter for primary discussion; and it having been decided, either upon the score of great utility or upon that of personal appearance, or, again, upon that of untoward sequences, as the induction of mal-occlusion, or of unsightly change of position of remaining teeth, etc., that the maintenance of the affected organ is very desirable, then, as a last resort, I would advise drilling through the alveolar process into immediate proximity with the apex of the root.

This, as may readily be inferred, is a very painful operation, perhaps not so much so as would be the extirpation of a living pulp, or the continued excavating of highly sensitive dentine, but sufficiently severe as a rule to demand the employment of some anæsthetic or pain obtundent.

For this purpose the first application is the *dental tincture of aconite*. This should be painted upon the gum, and allowed to dry in, at least two or three times, when, with the hand-drill or engine, the entrance may be made.

In former years I used a medium-sized spear-pointed drill for the making of these openings, but for the past five years I have pre-

ferred the trephine (of very small bore), as I found that it "vented" much more freely and without any correspondingly increased infliction.

Besides the aconite application, I usually add the obtunding power of a current of electricity. This is accomplished by attaching one end of the *positive* cord, from a "dental helix," to the drill-stock if a hand drill is used, or to the end of the "hand-piece" if the engine is employed. The connection is made by a ring of wire, which slipped over the stock of the hand-drill is not interfered with by the semi-rotatory motion of that instrument, and slipped over the "nose" of the engine hand-piece does not interfere with the revolving drill or trephine.

If one has not the means for applying electricity, it will sometimes become necessary to induce general anæsthesia as for extraction; as in the excavation of sensitive dentine, a partially anæsthetic condition will usually be found best adapted for the performing of the drilling operation. Directions in regard to this have been given in connection with the treatment of "sensitive dentine" (DENTAL COSMOS, July, 1875, page 338).

My experience in the results of this drilling has been varied indeed. In some cases the relief has been very great and almost immediate; in others it has been less in degree, and even this only after several hours; but in these cases the gradual improvement has been sufficient to encourage the patients to endure to the saving of the teeth. In a third class of results I have been able to "terminate" by suppuration, which I should not have accomplished without this *artificial fistula*; and yet again in others the pain has continued too great for endurance, and the teeth have been lost.

I have tried "replanting" twice, but it failed so signally both times that I have not thought it advisable to experiment further in this direction *in cases such as these*.

Constitutional Treatment of Periodontitis.—When constitutional treatment is indicated I would advise, first, attention to *diet, rest, and exercise*. The diet should be plain, simple, nutritious, and palatable. It should, however, be especially recognized that a complication not usually existing in any other condition of local inflammation is present in periodontitis, viz., an inability to masticate food. In ordinary cases, such as large boils or even carbuncles; in cases of severe sprains or even fractures; in extended local inflammations, as in pleuritis or even peritonitis, the power of properly masticating food is not at all interfered with; but in grave periodontitis all mastication is precluded upon the affected side, and but very partial comminution of food is possible even upon the well side. Thus it is that *special directions* have to be given with regard to its selection and

preparation. All such foods as broths, jellies, stews, "made dishes," light and delicate griddle-cakes, milk-toast, cracker-cream (exceedingly refreshing and sustaining), soft-boiled eggs, oysters (if they are acceptable), tender beef-steak, *scraped* and broiled, chicken croquettes, etc., should be provided and should be given, in limited quantity several (five or six) times a day, and *not* in large quantity, nor *only* at the morning, noon, and evening hour, which is by custom allotted to eating.

As the result of extended observation I would caution against any reliance upon the stereotyped "beef-tea," as it is generally soon regarded by patients as anything but desirable, and not infrequently actually provokes a shudder of disgust as it is monotonously brought on to represent "strength" in solution.

A broth made with boiling-hot water, in which is melted a large piece of butter, and which is *colored* and *flavored* by a small portion of the Liebig preparation, and seasoned nicely with pepper and salt, and into which a thin slice of toasted bread is broken, is usually far more palatable and nutritious, and is suggested in place of the "beef-tea" beverage.

Fruit, if relished, and especially *grapes*, should be given if they can be obtained; custards, ice-creams, charlotte russe, blanc-mange, gelatin, etc., are delightfully acceptable to those who are fond of such things.

It is by making judicious selections and ordering a diet from such articles as have been mentioned that much comfort, strength, and satisfaction may be afforded patients during the two, three, four or more days of tenderness and suffering incident to a case of periodontitis of the "third grade."

Rest should be insisted upon, at least during the first day of the attempt at affording relief. A neglect of this precaution is not unlikely to bring failure upon the best directed efforts, and this should be so represented to the sufferer, that it may be fairly understood that eventual success is dependent in considerable degree upon the care and attention to circumstances bestowed by both practitioner and patient.

While taking rest, *position* should be markedly regarded. The sitting posture should be maintained as much as is possible, that the force of *gravitation* may add its power for good to all that is being done; and when the recumbent position is assumed, that additional rest may be given from change of position, the *head should be elevated* as much as is consistent with comfort.

It will be recognized that depression of the head would naturally add to the flow of blood toward already oppressed parts, and that this should consequently be avoided.

Exercise should be controlled. Anything approximating *violent exer-*

cise of course could not be indulged in, but ordinary exercise, rapid walking, stooping, running up stairs, lifting things of more than very light weight, maintaining a *standing posture*, and thus increasing the heart's beats from five to eight pulsations per minute, should all be mentioned and forbidden.

It might seem, to one inexperienced, that there was no actual need for supervision such as this in "merely dental difficulty," but to the experienced practitioner all these points have their full importance. Many a case has been *lost* by inattention to this part of the treatment, and never has any case been injured by the fullest recognition and enforcement of it.

Even *forgetfulness* upon the part of patients has given a vast deal of trouble to their dentists and inflicted much suffering upon themselves, as during eminently successful convalescence, some rapid motion or extraordinary exertion has instantly produced recurrence of that fearful throbbing which had only yielded to twenty-four hours of accurate and well-directed treatment.

Like every other case of "relapse," we now have weakened tissue attacked,—parts which have largely been exhausted of their irritability (power of response) during a recent effort at the establishment of "reaction." It is this which makes *systemic* relapse so dangerous and difficult of treatment, and this which makes *local* recurrence of disease alike unmanageable.

But more than this,—far more than this,—there are few tissues so environed by unyielding surroundings as the peridentium. Were it not for the possibility of a certain amount of raising of the tooth in the socket, the walls embracing this inflamed membrane would be, so to speak, rigid, and it has been shown that this very lifting of the tooth produces that elongation which renders liable great pain from even the gentlest occlusion.

This it is which notably complicates the subduing of inflammation in dental practice; this it is which causes the imperative demand for exceeding accuracy in both selection and application of remedies; and this it is which underlies the want of success which characterizes many attempts in this direction.

All this renders it the more urgent that everything should be so directed as to insure, *first*, a reasonable success as the result of our treatment; and *second*, the greatest security possible against recurrence of untoward symptoms.

The *second* consideration in the constitutional treatment of periodontitis is the administration of a Seidlitz powder, or a dose of Tarrant's aperient, or a bottle of the usual citrate of magnesia solution. Any of these will act as a gentle derivant, and are suggested upon the old-fashioned, safe ground that "if they do no good they will do

no harm,"—an advantage which I have intimated is not possessed by all the medication in which dentistry indulges.

It is, however, reasonable to assume, upon general principles, that a slightly increased action of the bowels will, in cases of periodontitis of even ordinary gravity, be almost universally beneficial.

The only exceptions to this would be when a predisposition to enteric difficulty contraindicates any interference with bowel action or when existent frequency of evacuation is under treatment for control.

Such considerations would, of course, be the rare exceptions in practice, and, indeed, in cases of high grade periodontitis it will be much more frequently found desirable to produce *decided purgation*.

For this I have found a combination of citrate and sulphate of magnesia (Epsom salts) to answer admirably. Two drachms of sulphate of magnesia should be dissolved in a fluidounce of water; to half of this solution should be added half a bottle of citrate of magnesia, which should be given as a first dose; in an hour after add the remaining citrate of magnesia to the other half-ounce of solution of sulphate, and give this as a second dose. The effects of this method of administration are apt to be all that is desired.

It should be noted that all the various aperients and cathartics recommended are such as act upon the entire length of the intestinal canal, producing copious, watery discharges; this is what is required, for by this means we are enabled to "draw off" the greatest amount of the water of the blood, and at the same time least enervate the patient.

For this reason such purgatives as castor-oil, rhubarb, aloes, etc., should never be used in the treatment of periodontitis.

Should it be found that the citrate of magnesia is not conveniently obtained, the sulphate of magnesia will serve an excellent purpose; this medicine is usually given in unnecessarily large quantity, and really without an equally good result; experiments with this salt have taught me that a much more decided purgation may be expected from a *teaspoonful* of the medicament dissolved in *half a pint* of water than can be obtained from a *tablespoonful* dissolved in a gill of water.

I therefore recommend a liberal dilution of a small quantity of medicine rather than a strong solution of a larger amount.

Third. If suffering be too severe, and particularly if the patient be wakeful at night, moderate doses of tincture of opium (laudanum), say ten drops every half-hour (adult) until thirty drops have been taken if required; or, if it is desired to make a more decided impression, twenty or twenty-five drops may be given at first, and ten drops more in an hour after if needed.

For children it is usually better to employ the camphorated tinc-

ture of opium (paregoric elixir), of which the dose is from thirty to fifty drops.

The solution of the sulphate of morphia in doses of from one to two or three teaspoonfuls is also an excellent means for inducing sleep.

In certain idiosyncrasies opiates are not admissible; it is well therefore to inquire in regard to this, and especially if the patients be of the nervo-bilious, lymphatico-bilious, or bilio-lymphatic temperaments; from such it will often be learned that opiates keep them awake, and with some it is true that they are violent irritants, a single drop of laudanum being capable of blistering the skin.

With such patients I have frequently been successful by using the solution of the bi-meconate of morphia. This preparation, if well made, is usually reliable for producing a quiet repose, even though it does not induce sleep; but it will almost always do this, and is seldom followed by the ordinary opium headache. The dose of the solution of bi-meconate of morphia is from ten to thirty, or even forty drops, according to the age and susceptibility of the patient.

(To be continued.)

DENTAL EDUCATION AS A SCIENCE.

BY A. H. THOMPSON, D.D.S., TOPEKA, KANSAS.

(Concluded from page 237.)

WE do not mean by thoroughness of instruction in the sciences implicated in a complete dental education that we would make specialists of the students in any of those sciences, but that we would aim by their means to make *dental surgeons*, in the best sense of the word. The object of education should be to make of the student a competent dentist; an ornament to his profession and a blessing to those he serves. We would not have him become a great chemist, or physiologist, anatomist or other specialist, but if he should choose, in after-years, to devote his recreative studies to a special branch, it would be well. Every man, even in the dental profession, must have his "hobby," and if it should fall into a useful line his efforts should be encouraged. But the dental school should not cultivate specialists or any sort of one-sided development. A thorough education in this, as in other branches of learning, should, within its own limits, be symmetrical to the point of complete development and preparation for practice. Familiarity with all the natural sciences is necessary, but the time of the student must not be dissipated in the cultivation of one particular branch to the exclusion of others equally valuable to him in practice. After he has been pronounced capable of enter-

ing upon practice, however, his hobby may receive what attention he chooses to devote to it, but not during student years. Cases of one-sided development among graduates are not unknown to us.

The means by which this higher education is to be reached is a grave question. The systems we have known must be condemned and abandoned *in toto*; a something unknown must be looked forward to, and in the fullness of time be attained. What this shall be is the main question of the day.

The English system is much superior to ours in that it administers a thoroughly scientific education. In that respect it may be said to be ideal and all that could be desired. Its methods and principles, so far as scientific training is concerned, might be copied *in extenso* by us and be what we need so far as it goes, but it is insufficient. The English are deficient in manipulative and manual instruction, and to their system, if adopted by us, we would need to add our own manipulative skill and training. We can scarcely desire to adopt the English system in its entirety, on account of this subordination of art to science. We must have a system that combines both the science and the art to the exclusion of neither. Past American systems have been entirely indigenous and curiously free from European influence, having procured nothing therefrom but the sciences upon which they were founded. The *idea* of dental schools, special and independent, is thoroughly American, and of which we have, perhaps, reason to be proud. We erected the first colleges and the first system of independent education, but we have allowed the proud prestige to be sacrificed upon the altar of incompetency. We must now turn to Europe, the home of all our learning, for the charter of a new life for dental education. While humbled to admit this, we must accept the inevitable, and strive only for that perfection which we long to reach. Thorough reformation can only take place by the adoption of time-honored principles.

The connection of dentistry with medicine is a subject which must be noticed in this connection. Much has been said in favor of the idea of dentistry being a specialty of medicine, and much against it. But the one main fact for us to recognize now is, that whether we will it or not, whether we are really medical specialists or only dental prosthetists, we are to all intents and purposes a separate and independent profession. In reality, the position of the two professions toward each other is that of simple ignorance of each other's existence. Medicine does not recognize a relationship with dentistry, nor does dentistry recognize medicine. In theory we may be a branch of medicine, but in fact we are not. The two professions simply ignore each other. Ours is a surgico-artistic profession, and we can make nothing more out of it. Mechanical occupations constitute

the largest part of our duties, much as we may dislike to admit the statement. It is true that many sciences, medical and others, contribute toward the making up of our *ensemble*, but our work is after all more mechanical than medical, more prosthetic than therapeutic, and the sooner we accept our position as an artistic and surgical profession, and let go the claims to things with which we have little concern, the sooner we shall attain to a true and honorable position.

The main means by which we would attain that higher education which we so much covet, would be by one great *National University* of dental surgery, chartered by Congress, heavily endowed, well located, belonging to the whole nation, and equipped with a corps of investigators and instructors teaching all the connected sciences, teachers in practice, etc., and possessed of all the conveniences and appliances for teaching. The start of such an institution is, of course, the endowment. This is necessary to secure its efficiency, to command and reward the best talent in all departments, as well as to lift the institution above debasing competition and favoritism. Until it can be beyond considering the amount of its patronage, disregarding the size of its graduation roll, unbiased by personal or other prejudices, and look only to the issuing of capable men, it will do no good whatever. It must be above rendering graduation "easy." Its diploma must be given only for *fitness to practice dental surgery*. Its standard must be high, and be applied without fear or favor. It must place every man upon his merits, without regard to the possible effect of his rejection. Until every bias can be laid aside, and a high standard be fearlessly maintained, true success in dental education cannot be attained.

To the end of producing an honorable and competent alumni, there must be good instructors of every kind. The best men in the profession must be secured and employed as investigators and teachers. The best anatomists, physiologists, pathologists, therapeutists, pharmacists, chemists, metallurgists, operators, mechanics, artists, etc., must be appropriated to this great work.

The best and noblest men must first be secured, and after these, teachers must be reared for the work. This would properly belong to a normal department. Young men possessed of special talent and genius for special things and of great promise, should, after graduation, be taken and prepared for the work of teaching, first serving as assistants in their special departments, there to be allowed to grow into the life-work for which nature has peculiarly fitted them. It is not too much to claim that the children of genius should be appropriated to the priesthood, for genius is rare and teaching is a sacred work. Besides, teaching is a business which requires for its successful practice a special fitness and training, and men should be specially taught

for it as for other professions. And again, the hope of dental education for the future is in scientific, trained teachers. The so-called *practical* man is not a good teacher because he is *practical* in practice. Practical knowledge is a thing to be gained by practice only, and must be learned by every student for himself when he enters active service,—it cannot be taught. If medical education, as well as dental, is going to pieces to-day before our eyes, it is for the want of scientific teachers,—men trained to the work of teaching the medical sciences, and *appropriated exclusively to the work*. Professional teaching is a profession within a profession, and must, in the time to come, be exercised by a special class,—those formed by nature and training for the work.

But all this will take great sums of money! Of course it will. Nothing good can be obtained or performed in dental education, without great expenditure. The effort so persistently and continuously made to educate cheaply, is the cause of our present ruin. Our system is “cheap” in every respect. But, unfortunately, knowledge is not a cheap commodity. It costs money, labor, and force. The starting-point of a great reformation in dental education is a great endowment. Nothing short of that will lift us any higher than we at present are. We may change cheap systems, but we can get no better than the present unless we pay more for it. The cost of knowledge must be borne by some one able to pay, and we cannot make others bear the expense of our education. We cannot get knowledge second-hand. If we want it we must furnish its equivalent, for it cannot be procured without the cash. The only means of insuring the support and success of an institution is a great endowment, and that would insure it. That once secured, the remainder would follow as a natural sequence. If the means were once in our possession we would not long deny ourselves the luxury and necessity of a scientific education. Yet this would not follow at once, naturally and easily, for we are not yet capable of the better things of that golden age. We must be educated even to that; but it would follow, and our education would in time be elevated to a scientific basis.

Such an institution would make its influence felt with a large class of men who constitute the majority in every avocation, and to whom learning is a difficult thing. This class is typified by the ordinary, the average, the mediocre man, and his “name is legion.” We, to-day, most need an institution or a system which will lift the mediocre man above mediocrity, which will aid the earnest, studious man of limited capacity to attain proficiency, and so enable him, when he goes forth among the common people, from whom he comes and to whom he belongs, to serve them well in his profession. It is not too

much to claim that the great bulk of dental services performed for the people of this nation are rendered by the ordinary, mediocre men of the profession; the men of limited capacity and education. Is it, then, too great a demand that this class shall be especially provided for? The human race, in all parts of the world, could not furnish a sufficient number of men of genius to fill the dental offices of this country, to say nothing of other avocations; so that the princes among us must ever be as few as in other callings. The men of genius will rise to still greater heights under our new system, and the intellectual paupers will fall through the discriminating sieve of an elevated standard, to drift away upon the human tide to their proper level. For the latter class, the ignorant by nature and education, we make no provision in the new system; but the earnest man, lacking only the genius which insures success in the face of obstacles, must be developed by the best possible cultivation of his powers which can be provided for him, to the end of insuring the future usefulness and dignity of the profession.

But to the dignity of knowledge must be added the dignity of manhood. Unless a man is a *man* in the truest and holiest sense, his knowledge is belittled by its association with a little soul and a degraded character. Unless he maintains a true professional dignity, with respect for ethics and professional honesty, he becomes as one of those whom he looks upon as the outcasts of the profession. A great deal of bosh and nonsense is expended upon the subject of the "high calling," the "nobility," "dignity," and what-not of the dental profession, by a certain class of sentimental votaries. We are asked to believe that dentistry is, *per se*, by nature an elevated and "high-toned" occupation. It is, in point of fact, no more "noble" or "high" than other professions which serve humanity by alleviating suffering, rendering health possible and life endurable. "Only this and nothing more." It is noble to thus serve humanity, but other vocations do equal service, and a profession is only noble as this service is nobly rendered. Its nobility consists in the nobility of those who follow it. In the hands of some of its practitioners, dentistry becomes a very ignoble occupation. In the hands of others it becomes great and grand, because they are great and grand men, who would ennoble any calling. There is the difference; but the nobility of these men does not extend through the medium of the profession to those who unworthily practice it. The real greatness of any calling in life, its actual value to man and all that goes to make true worth, depends solely upon the character and ability of those who administer it.

Dentistry is an ignoble and degraded calling when its practitioners make it so, but it is dentistry still, much as we may decry and despise the charlatan. It still has to do with the teeth, and the people still

call it dentistry. Such a rendering of it makes it anything but a noble calling. But even this is after all only the stamp of the man upon it. If dentists become learned, pure and noble in mind and character, self-sacrificing in their practice of the profession and their service of humanity, dental surgery will be elevated to a greater height than has yet been attained, and *not* because it is *dentistry*, but because of the men who honor the calling by becoming dentists. Medicine and law are, *per se*, noble professions, worthy of the highest intellectuality of our race,—the one, because it administers to suffering and disease; the other, because it rights wrongs and punishes wrong-doers,—but, as practiced by some of their members, these professions become ignoble and unworthy to the last degree; and yet such men are doctors and lawyers still.

While dental education is largely a question of political economy, in that the people should be protected from incompetency and dishonesty, it is doubtful if legislation upon the subject can accomplish the wished-for end. It may suppress total ignorance to a large extent, but it cannot force mediocrity into thorough competence. The reformation must come from within. We must become self-regenerated. We must make sacrifices and put forth herculean efforts to lift ourselves upward.

We must strive even for things we can scarcely understand, and certainly cannot appreciate. We must aim at a precision in education totally foreign to our experience. We must hold fast to that thoroughness which shall teach of all human knowledge within the bounds of our needs. We must unite deductive and inductive methods in harmonious completeness. We must lay the foundation of *principles* before we erect the superstructure of *methods*.

Let us, then, educate perfectly.

THE INSTRUMENT CASE.

BY W. H. TRUEMAN, PHILADELPHIA, PA.

A WELL-ARRANGED instrument case, an *attractively* arranged case of dental instruments, aside from its convenience to the operator, is a legitimate advertisement not to be despised; an advertisement whose value is often impaired by making the case itself attractive rather than the instruments it contains; and, again, is often lost by making the display so conspicuous that it becomes disgusting.

Some patients have no desire to see the instruments, while others find pleasure in examining them, and no doubt in many cases their condition and arrangement is a factor in winning our patients' confidence and esteem. It is well, therefore, to have them so placed that

if they wish to see them they can; but do not unnecessarily compel them to endure the sight of implements they may soon have ample cause to hate.

The ideal instrument case, we may say, is that case which best suits the taste and convenience of the operator. It is presumable that we all like that best which we use and are accustomed to; but we have thought there are some general considerations affecting the usefulness and convenience of this indispensable article of office furniture which may be profitably considered.

The most important part of the instrument case is that which contains the tools we are constantly using, and the first question to consider in arranging it is, how many tools and how many kinds of tools is it necessary to have in constant use?

For several years we have been trying to solve this question, as each one must for himself, and have succeeded in ridding the case of a large number whose usefulness was not sufficient to compensate for the labor of keeping them in order.

We find the convenience of knowing thoroughly the condition and capacity of each instrument—the saving of time from being able to select the instrument needed at once, and saving of labor in keeping them in order—amply compensates for the occasional inconvenience of having to “make out” with an instrument not exactly suited to the purpose.

A set of say from six to twelve excavators, in good order, ranging from new to those nearly ready for repointing, and the condition of each well known, we find far more satisfactory than a drawer full of various shapes and styles that must be overhauled to find one suited to the work in hand.

This weeding out has not only reduced the number, but has permitted a more systematic arrangement, and allowed them to be brought closer together without confusion; so that now, if need be, while one hand is in the patient's mouth the other can reach each and every instrument in the case.

For convenience in working we much prefer the style of case occasionally seen in the offices of some of our older dentists. A case with a lid that is raised up from the top, exposing a number of compartments, and provided with several drawers which open and can be kept open without being in the way or interfering with each other; so that when the lid is raised, and the drawers are open, every compartment is fully exposed, and every instrument readily accessible.

The more modern arrangement, with its complicated system of drawers and closets, which it is necessary to be constantly opening and closing, aside from this inconvenience, must be supplemented

by a table to receive the instruments laid aside when we change, say, from excavating to plugging. This table is soon crowded with a miscellaneous and confused collection of instruments, etc.; at least that is the condition we have usually seen it in. Some systematic men may avoid this confusion, but whether it is avoided or endured, it entails a loss of time, and demands a share of attention that might be better employed.

The various ingeniously arranged extension tables, with drawers, etc., afford a measure of relief; but we doubt the propriety of placing an "annex" instrument case immediately under the patient's nose; and considering the care of keeping it in order, the danger of the wood's becoming offensive or injurious to the instruments from water or medicaments, etc., spilled upon it, it is a question if it is a *real* convenience, and whether it would not be better to consider the necessity which compels the extension table being made more than a temporary rest for the instruments immediately in use, as evidence that the instrument case itself needs revising.

If the compartments of the instrument case are all open, and within easy reach, it is just as easy to lay them (the instruments) in their places at once, reversing their position, or by some other equally simple means indicating that they have been used, and are candidates for cleaning and sharpening at the first convenient leisure.

Dental instruments in use are especially exposed to corroding agents. The saliva of some mouths, and some medical or chemical agents we frequently use, in spite of all our care, or through some accidental neglect which the most careful are liable to, cause them to rust rapidly. These corroding agents will act more rapidly, and will likely have more time in which to do mischief confined in a drawer than in the open compartment. In one case the mischief is seen at a glance; in the other, it is more likely to be overlooked.

We suggest that the instrument case should be exclusively occupied by the tools, appliances, medical agents, etc., in constant use, and which convenience requires should be within easy reach. The new or repointed and worn-out instruments should be kept apart, and not needlessly exposed to accident or rust.

It is a good plan, also, to arrange for keeping the pluggers and burnishers entirely apart from those used in excavating. These two classes of instruments are usually more permanent and valuable; though less exposed to corrosion in actual use, their usefulness is more impaired by it; it is, therefore, desirable that they should receive extra protection and care.

If medical or chemical agents are kept in the same case with the instruments, we suggest that they should be in a compartment *below* the instruments, rather than above, so as to lessen the danger of in-

jury from accidental spilling or breakage. Some of these indispensable agents are very destructive to the beauty of polished steel, and if they are spilt upon and soaked up by the wood of the case the annoyance from rusting may continue a long time.

The almost imperceptible fumes from the medicine kit are also open to the same objection ; so it is best to isolate them as much as possible.

Gold foil is said to have its cohesive properties seriously impaired, when kept in a drawer, by the motion of opening and closing. To avoid this, it has been recommended to keep it as on a shelf, covered by a flat weight a little larger than the book. This not only keeps it straight, but also protects it in a measure from the various gases, moisture, or volatile matter in the atmosphere which we know impairs so greatly its cohesive properties. If kept in the case, it is well to arrange a compartment especially for it, like a closet or box, so that it can be reached without imparting any motion to it ; especial care being taken to have no communication between it and the medicine compartment.

In lining the case it is well to remember that some dyes, especially those used in producing scarlet and crimson, have the property of rusting steel, and retain it a long time. All scarlets and crimsons do not do so, nor is the trouble exclusively confined to those colors ; but we have heard more complaint from them than from any other, and know several instances where the lining had to be removed on this account. A polished instrument wrapped in the material intended for this use will soon demonstrate if it is suitable or not.

White paper, which may be had of any printer cut to the exact size, laid at the bottom of the drawers or compartments adds very much to their appearance, and if supplemented by a sheet of oiled or waxed paper under it will neutralize to some extent the tendency to rust, and being inexpensive it may be renewed as it becomes soiled.

We notice that most instrument cases are provided with a drawer in which to keep clean napkins. This we consider highly objectionable. Very few cases are entirely free from unpleasant odor after they have been in use a few years. The creasote, carbolic acid, etc., the peculiar and unpleasant odor carried to it by the instrument used in treating diseased roots and decomposed pulps, etc., after a time give it a characteristic "shop smell," perhaps imperceptible to the operator, but quite noticeable to those less accustomed to the atmosphere we are compelled to breathe. This smell the clean linen readily takes up. I have frequently noticed it unpleasantly when the napkin fresh from the drawer has been placed in my mouth by a brother dentist. We have also noticed a place provided for stowing the soiled napkins until wash-day. This we consider simply unpardonable ; they should be removed from the room at least at the close of

each day's work; at once, if much soiled by blood or the saliva of offensive mouths.

We consider it better to keep the stock of clean napkins as far from the chair and case as the limits of the room will allow.

For years we have been in the habit of removing all the instruments from the case, and the case from the operating-room, and leaving them open and exposed to the light and air while taking our summer vacation, for the purpose of preventing these unpleasant odors taking permanent possession.

We have purposely avoided describing any particular form or arrangement of the case, as we simply desired to call attention to a few points which (we have thought) are frequently overlooked.

In conclusion, we suggest that the case should be made small and compact, and yet plenty large enough to hold all that is needed to be within easy reach of the chair.

It should be so arranged that everything it contains is within easy reach and readily seen, and have no "holes" or "corners" for the accumulation of rubbish, or where light, air, and the dusting brush cannot reach.

It may be made as ornamental as desired, provided, that in the desire to have a handsome piece of furniture, its use and office is not lost sight of.

CLINICAL REPORTS.

PHILADELPHIA DENTAL COLLEGE—DEPARTMENT OF ORAL SURGERY.

SERVICE OF PROF. J. E. GARRETSON.

THE case here shown is one of special interest to the mechanical dentist; it has been sent to the clinic for treatment by Dr. Wardle.

As I open the mouth of the patient you observe that the whole alveolar ridge of the right side of the lower jaw is overlaid by a tumor. This tumor, as I push it aside, is seen to be a polypus, having a base of attachment occupying a position corresponding with the mylo-hyoid ridge; the habena being in length equal to the size of the body of the growth.

Pressing this tumor between the fingers the impression is conveyed of an emptied sac. The walls of a collapsed abscess rubbed against each other expresses the feel exactly. The size of this polypus equals in length and bulk the second and third phalanges of my index finger. The thickness of the long pedicle is about equal to that of a silver half-dollar.

It will be observed that the alveolar ridge has been prepared for

the insertion of an artificial denture; absorption is apparently long since accomplished. The difficulty at present, so far as insertion of new teeth is concerned, is the overriding tumor. How shall we get clear of the growth?

To cut it away would accomplish the result speedily. To do this, however, would be to court considerable risk. Just beneath this tumor, and not unlikely associated with the footstalk, is an artery lying in a loose sheath, and known to you all as the mylo-hyoid. Once upon a time, as the result of an operation performed in this college, I had to ligate that vessel at midnight in a little back street up town when the only light to work by was that given out by a tallow dip. Let me advise you, young gentlemen, not to be ambitious of repeating the experience. It is about as easy to catch an eel with a pin-hook as to fish out from its sheath a retracted mylo-hyoid artery.

We will remove the tumor by ligating it. The curved needles held in my hand are double threaded. The strangulation will be in three sections, for thus only would it be possible to compress so lengthy a base. The needles being introduced from without inward, you now observe on the separation of the thread my ability to make the three ties. . . . The knots are now made. A few moments and you will find the mass from which all circulation is now cut off growing, first a dark red, next a purple, after that black. Within a week the tumor will drop away.*

* * * * *

Here we have another example in oral surgery. Looking into the mouth of this child you remark a ragged tumor involving several teeth and possessed of a very threatening appearance. These teeth, as pressure is made upon them, are found quite loose, seeming, indeed, to float in the soft tissue. The ragged mass is spongy in character and disposed to bleed on slight provocation. The age of the growth is six months. The pain associated with it gives occasion for but little complaint.

What is the nature of this tumor? What are we to do in the way of cure?

First. We pronounce the growth a neoplasm, for the reason that it is without that self-definition which separates benignancy from malignancy.

Second. We call it epulic, as designative of location.

Third. We assume to class it with the order myxomata, esteeming out of experience that the diagnosis will be indorsed by a microscopical exhibit of its histological elements.

* The patient being shown two weeks later, not even any signs of the operation were to be seen. The cure was perfect.

The treatment of a neoplasm is extirpation; this because there is no known specific for the cancer vice. If we let this growth take its course the child certainly will not live over a year. If we thoroughly remove it she may get well. Whatever the result, experience shows but a single road to pursue. I shall ablate the tumor, together with the bone with which it will be found associated.

It will not be amiss, however, that we make examination of the bone assumed to be involved. This some members of the class shall do. Here is a sharp steel probe. Pass it through the soft parts and tell what you feel.

ANSWER.—The bone is soft, the instrument goes into it.

That is to say, gentlemen, the bone is like a honey-comb. This is always the case; no probability of being mistaken. The hard parts being involved, what possible good could be done by any operation that did not include the removal of such parts? Cases often come into my hands for treatment where patients tell me that many operations have been performed. What is meant by this is that sundry slices have been cut from the top of a growth. Than such practice nothing can be worse, except indeed it may be extraction of teeth making the boundaries of epulic cancer.

Concluding upon making a section of the jaw, we have to consider the manner of doing such operation. Cutting forceps do the work quickly. Objection lies, however, in the associated roughness of manipulation, and in the fact that a wound so made repairs slowly. A circular saw revolved by the engine makes the required cut delicately and cleanly. We will use the saw.

The patient upon the table has not yet erupted all her second teeth. The imbedded bicuspidati are particularly in the way of a horizontal cut required to be made. I have known the teeth of a saw coming in contact with these teeth turned as though the instrument had been made of soft iron. I had an experience of this kind only a few months back in the city of Newark, while doing an operation on the jaw of a little boy, a patient of my friend, Dr. Pinkham. In making a resection of the jaw, always inform yourselves as to the state of dentition. . . .

The little girl being now etherized, I introduce these two spatulæ, which serve very well both to hold away the lip and cheek and to protect the parts. Next I make sections of the gums inside and outside. The cuts circumscribe the tumor and reach the bone. Now the revolving saw follows. . . . I hold tumor and section of bone in my hand. Examining the base of bone removed, seeing it to be clean and healthy-looking, hope is to be indulged that the cure will be found permanent.

I have to caution you against the old manner of treating this

kind of tumor. That old manner was to cut the full section of the jaw, leaving the patient necessarily forever deformed. I have seen such manner of operation done very many times. I have clearly demonstrated by my own practice that in a majority of instances it is inexcusable. The section is to be made as done before you this morning. The rim of the jaw is not to be disturbed.

If no inflammation sets up in the present case, the patient will need alone to rinse the mouth several times a day with dilute tincture of myrrh or dilute phénol-sodique. If vascular disturbance ensues, lead-water and laudanum will be prescribed. Tincture of calendula diluted many times with water furnishes an admirable application. Severe inflammation would be combated by constitutional treatment and by leeches to the border of the jaw.*

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR meeting of the society held at the residence of Dr. C. E. Francis, Tuesday evening, March 16, 1880.

President, Dr. W. A. Bronson, in the chair.

INCIDENTS OF OFFICE PRACTICE.

Dr. E. G. Roy. I have a case of a lad of sixteen, who fell and broke both superior centrals. The pulp of one was protruding and very painful; that of the other was but slightly exposed. I would like to ask what is the best treatment for such a case.

Dr. F. N. Seabury, Providence, R. I. I have a similar case. A girl of ten broke both centrals so that the pulps were slightly exposed. I covered them at once with collodion, after which they were free from pain. I hope to keep these pulps alive, but in such cases I find difficulty in retaining a capping material of any kind. Will some gentleman suggest the best means of securely attaching a durable protecting material?

Dr. S. G. Perry. I should suppose two delicate gold screws could be set in such a way as to retain a capping of the oxyphosphate of zinc.

Dr. J. B. Littig. For a similar case I ground out a cap of porcelain from an English tooth, and set it on the end of the broken right superior central with Fletcher's oxyphosphate of zinc. I intended it as a protection to the pulp, which was not quite exposed. It has now

* This patient was shown to the class after three weeks, the wound being thoroughly healed.

remained in place nearly two months, and the tooth is doing well. At the same time, on the broken end of the right lateral in the same mouth, I placed a covering of the cement alone. It is still on the tooth and doing well. I consider it the best material for such cases.

Dr. Wm. Jarvie, Jr. I think the oxyphosphate of zinc is the best material we have yet had for such cases. It is less irritating, and less likely to cause subsequent death of the pulp.

Dr. W. H. Dwinelle. In such cases I have sometimes made an undercut around the borders of the exposed nerve with a fine drill. The oxyphosphate readily enters these drill-holes and securely holds the mass that caps and shields the nerve.

In connection with Dr. Eugene Palmer, who is associated with me, I had an interesting case of a young man from Cooperstown, aged about twelve years, who broke off the right superior front tooth obliquely almost to the pulp. His sister picked up the piece and put it in her pocket-book, and brought it to me. If she had gone a little further and kept it moist, it would have been better. It was remarkable that it had not cracked or checked. The tooth was very solid for a young man of his age. The portion broken off was almost entirely enamel.

With a diamond drill two vertical holes were made near its outer border. Corresponding holes were drilled in the tooth, and after interposing a thin wash of Weston's cement, it was secured to its place firmly with gold screws. It has remained there since last August, solid and firm, perfect in all respects. In some lights it is not perceptible that the tooth has been broken, in others but faintly so.

I have often had patients who had broken off the front teeth come with the pulp exposed, and in almost every instance, when I have undertaken to save them, I have been so fortunate as to be successful. Where the case seemed to be hopeless, I have sometimes destroyed the pulp. But I have no difficulty in getting caps over exposed pulps, by simply drilling around the borders, and covering them with the oxyphosphate of zinc. I have cases on probation now, some of them of six months' standing. I am waiting for the pulp to throw out a covering of bone, when I shall proceed to restore their lost contours.

An interesting case came under my care about two years ago. A lad of nine years of age broke his superior centrals. The pulp of one was exposed, and nearly one-third of the length of the tooth was gone. Some member of our profession advised extraction. I thought I could do better than that. I cut a groove around the exposed pulp and capped it. Six months after, the breach was closed by a deposit of secondary dentine. I then drew the tooth down until the upper edges of the fractures were nearly even with the cutting edges of the

laterals. I held them in that position until a deposit of bone had been made at their bases. I then built across their broken ends with gold, restoring their contours. At their approximal median angles the gold is just in sight, but the teeth are not deformed.

Dr. Jarvie. In drawing down the superior incisors nearly one-third the length of their crowns, the thick portion of the teeth would interfere with the proper occlusion. The pulps of the teeth being alive, I would like to ask Dr. Dwinelle how he overcame this difficulty.

Dr. Dwinelle. I made a compromise between the upper and lower teeth. I cut away the lingual walls of the superior and the cutting ends of the inferior centrals. The articulation was so favorable that but little of this cutting was required. I think I may say that what was done is scarcely perceptible on careful examination. At our next meeting I will show the models illustrating this case.

Dr. Perry. This is an interesting question and one that should not be too hastily dismissed. What is the best thing to do with one of these broken centrals, suppose you see the patient so late that the pulp is dead, or is so far gone that it cannot be saved, the break being one-fourth or one-third the length of the crown?

Dr. George S. Allan. Put on a Richmond crown.

Dr. Perry. That, of course, is one plan, but are there not some strong reasons for placing an artificial tip, using the root-canal for its support? I have treated quite a number in that way and they are all doing well. Having an interesting case of this kind some time ago, I was asked by the young girl's mother why I did not cut the crown off near the gum and set a pivot-tooth. My reply was that that could be done when the artificial tip failed; if it could be kept on for ten years, the tooth could then be pivoted and ten years' service gained.

But great care was required to make a perfect joint, and I had no end of trouble in getting the right shade of tooth. Following the suggestion made by Dr. Bogue some years ago, I used copal varnish to fix and retain the color of the tooth, and yet after all my care, in certain lights I could detect a slight difference in color between the tooth and the tip. The joint did not show, nor did the difference in color, except in certain lights. Considering the great care that is needed in such an operation, and remembering that as time goes on the natural tooth will be likely to change color, making the difference between it and the tip more marked, one may well ask, as Dr. Roy has done, What is best to do in such cases?

Dr. Dwinelle. I think I should have done as you did.

Dr. Jarvie. With the crown cut off at the gum and an artificial tooth inserted, the root would be more likely to give out in a few years. I do not think there is any greater danger of change of color

than there would be in any pulpless tooth treated as Dr. Perry treated this one.

Dr. Perry. Perhaps not, but there is this to be borne in mind: a live and a dead tooth standing side by side may actually differ considerably in color, and yet seem to match, but the artificial tip comes in such close apposition to the end of the natural tooth that the color must be perfect, else it will be noticed.

It is very difficult to make this perfect match, and this slight difference of color was what pained me, and made me fear that in time it might grow worse.

In the treatment of such broken teeth a better appearance can be secured, and with less trouble, by cutting off the tooth at the gum and attaching a complete artificial crown; but in all favorable cases I have followed the other plan, for the reason just mentioned by Dr. Jarvie. Certainly a more durable joint can be made if it is free from the gum than can be made at its margin, or under it.

Dr. Frank Abbott. In reference to the operation of drawing teeth down, without having had an extended experience, my opinion has always been that the teeth thus elongated sooner or later return to their former positions, and that the wearing off of the points of adjacent teeth does more to correct the appearance than the elongation of the broken teeth. In reference to the grafting of tips upon teeth instead of restoring the crowns with gold, some six or eight years ago, long before I remember of having heard any gentleman speak of it, I performed the operation for a young gentleman, in something like the manner described by Dr. Perry. The left superior central incisor had been broken very nearly at right angles with the body of the tooth, and so high up as to expose the pulp. The pulp had died, and had become so decomposed that the tooth was very much discolored. After having removed the decomposed pulp, treated and filled the canal, I carefully fitted an artificial piece to the tooth, drilled a hole each side of the pulp-chamber and screwed the piece fast, filling the pulp-chamber and cementing the joint with oxychloride of zinc. Some months after the operation, the gentleman sailed for Europe with the tooth in a very perfect and satisfactory condition, since which time I have not seen him. There was one peculiarity in reference to the appearance of this tooth, and one which I have observed in all such operations since,—*i.e.*, in some lights the tip looked lighter than the tooth, and in others darker. In another case, some years later, I experienced no end of trouble. This was in the mouth of a lady where both superior central incisors were so slightly broken that the pulps were still alive. The pieces I put on were so slight that she very often broke them off. After having replaced them several times, I conceived the idea of fitting pieces of platinum to the

teeth, and having bits of teeth baked on their fronts. This plan worked very well with one of the teeth, but the other was continually being broken off. At last I drilled a number of little holes into the platinum, and covered it over with oxychloride of zinc, obtaining the shade required by adding a little carbon as I mixed the cement. This seems to answer the purpose better than anything before tried in this case.

Dr. E. T. Darby, Philadelphia. I have been exceedingly interested in listening to the recital of these cases of fractures in incisor teeth. They are serious accidents, especially if they occur in children before the tooth is fully calcified. We do not always know just what to do. We desire to retain the vitality of the pulp, but when the line of fracture is across the pulp-canal it is hard to do so. If the pulp is devitalized there is danger of discoloration, and also cessation of calcification. The practice which has been alluded to, of covering the exposed surface of the pulp with some of the plastic non-conducting materials, is open to one serious objection, namely, that it does not adhere to the tooth for any considerable time. The best of these materials, in my opinion, is the oxyphosphate of zinc, and I am glad to have heard the gentlemen present express themselves so favorably with respect to it. I use it quite constantly for capping pulps and for filling the major portion of large cavities, *then covering with gold*. I do not look upon it as a permanent filling when exposed to the secretions of the mouth. The method of engrafting porcelain crowns or tips upon fractured teeth has also been spoken of. I have seen some very beautiful operations of this kind of Dr. Webb's. In devitalized teeth there is always the danger that the remaining portion of the crown will change color, whereas the porcelain piece does not, and after a period of months or years the contrast is unsightly. The teeth made by Ash & Son, of London, are best suited for this purpose, for the texture of the tooth is exceedingly hard and fine, and will admit of a beautiful polish even though it has been ground upon its face.

Dr. Allan. I had a case of loosening of the lower teeth caused by tartar. Three of the front teeth were so loose that I could almost pick them out. After cleansing them carefully I took an impression and made a plate, extending it over and below the margin of the gums, and half-way up the crowns of the teeth, and clasping it to the bicuspids on either side. I attached to the plate small retaining bands, which projected between the teeth and held them firmly in position. This plate has been worn four months, and the teeth have acquired a surprising firmness. But the point I wish to draw the attention of the society to is, that the deposit of tartar is now made upon the plate and not upon the necks of the teeth. The teeth are so firm that I think the patient may keep them for many years.

Dr. A. L. Northrop. A singular illustration of the injurious effects of dental rubber has lately come under my notice. The patient was wearing partial upper and lower sets of teeth on a gold base, the teeth being attached to the plates by black vulcanite. On the upper set, forming the "bites," at the bicuspid, was a small layer of English pink rubber, each piece being perhaps half an inch long and one-sixteenth thick. These were the only portions of colored rubber in the mouth. After wearing this denture about a month, the patient presented one of the worst cases of salivation I have ever seen. But immediately upon the removal of the plates the case began to improve, and the patient is now nearly well. The case is one the like of which I have never heard of before. The patient's health is not good; his general condition, however, being simply the result of a nervous break-down from overwork. He has not taken any medicine for more than a year past. His physicians can detect no cause for the salivation other than the colored rubber on the upper plate.

Dr. E. A. Bogue. Has not Dr. Northrop found, in the course of his reading, a record of some cases of salivation having occurred from the use of simple gold plates, without any rubber?

Dr. Northrop. I have seen records of mouths becoming sore under many kinds of plates, but never those which, to my mind, appeared to be undoubted cases of salivation from the use of such plates. The Transactions of the British Odontological Society, of some four or five years ago, contain an account of a case more nearly like mine than any other that I know of. My patient's tongue and the roof of his mouth even back to the throat were covered with ulcers.

Dr. Bogue. Does Dr. Northrop attribute that condition to the rubber on the plate?

Dr. Northrop. Yes, sir. I have known the patient for fifteen years, and during that time he has never had a severe attack of illness, and has taken very little medicine. He is a man of strict habits; and, were it not for the condition of his nervous system, would be of excellent physique. He has, to my knowledge, worn a plain gold plate for the past fourteen years, with no bad symptoms until this new piece, with rubber, was put in.

A lady came to me wearing a denture on red rubber. She was troubled with dryness of the mouth, dyspepsia, and chronic diarrhœa. Upon my advice she dispensed with the rubber plate for a week, when the symptoms disappeared. Upon re-using the rubber plate they returned. Finally the red rubber plate was replaced by black rubber, when the symptoms entirely ceased, and did not return.

Dr. Bogue. The same symptoms also occurred, recurred, and sub-

sided in the case of a little girl wearing a red rubber regulating plate. Yet I would not pretend to say that the plate caused them.

Dr. Northrop. The plates were perfectly clean, also the teeth, and very little rubber was used. I think this case brings the matter so fairly before us that we cannot dodge the issue.

Dr. Bogue. I hope Dr. Northrop will not be too sure that he has found a case that cannot be explained by well-understood laws. It is not many years since two or three physicians attributed the death of a woman's jaw to arsenic. Our friend, Dr. Northrop, took the question up, had the jaw analyzed, and found no arsenic.

Dr. Geo. A. Mills. I wish Dr. Eccleston was here to tell about a lady who wore a black rubber plate, and whose mouth was a reeking mass of pus where the plate had been worn. The plate was made of black rubber entirely.

Dr. Jarvie. This discussion is very interesting to me, as I have recently had a case bearing upon the same subject. Some two months ago a girl about twenty years of age was sent to me with the request that I would state whether I thought the full upper set of teeth on rubber, which she was wearing, was the cause of her poor health, her physician having said her sickness was brought about by galvanic action caused by the rubber. The girl had been in excellent health until last summer, when this set of teeth was made. Since that time her health had gradually failed. I found the corners of the mouth very sore, the tongue dry, parched, and glazed, with deep furrows in it. The roof of the mouth, however, where the plate came in contact with it, was in as healthy a condition as I ever saw in any mouth. I made a celluloid plate for her, and have not seen her since. But the lady with whom she lives told me to-day that the corners of the mouth were entirely well, and that the girl was gradually recovering her health. I will not attempt to account for the conditions observed in this case, but simply give you the facts.

Dr. Darby. We frequently meet with cases where there are or have been serious consequences arising from the wearing of red rubber plates. For my part, I do not understand how the mercury gets out of the plate and into the system. It is said by some that the sulphuret of mercury with which it is colored is inert, and if so, it could not produce the serious consequences complained of. We are constantly meeting with mouths which seem to be affected deleteriously. Whether it is owing to the non-conducting properties of the material or to the mercury, I cannot say. In my opinion, the red rubber is a poor base for artificial teeth. I have seen many mouths which resembled in appearance that described by Dr. Northrop. But recently a lady consulted me about the condition of her mouth.

She was wearing a partial plate made of red rubber. She complained of her mouth (under the plate) feeling heated and sore. It presented that abnormal appearance which many of you have observed when a rubber plate has been worn. I suggested that she substitute a platinum or gold plate. I inserted a gold plate, and after a few days she returned, and I found that her mouth had assumed a healthy appearance.

Dr. Abbott. This rubber question interests me immensely, as I presume it does every gentleman present. Nearly every day patients come to our offices to inquire what causes such a soreness of their mouths under and around the rubber plates they are wearing. Until within the last four or five years my answer to such questions was that it was occasioned by the lack of thermal changes, which were prevented by the non-conductibility of the rubber; but when I saw not only the parts covered by the plate, but the tongue and fauces, in a swollen, hyperæmic, and, in some instances, an ulcerated condition, my answer did not cover the ground. It is a well-known fact, I believe, that the red rubber generally used contains from one-third to one-half its weight of the "red oxide of mercury," and from what I have seen of its effects in the mouths of patients, I have not the least doubt that many persons are being *seriously* affected and their lives placed in jeopardy by its use.

Dr. N. W. Kingsley. I have reflected much on this rubber question and its effect upon the mouth. I question whether we are such close observers of certain facts in relation to other facts as to be entitled to the name of scientific observers. We see one thing only and do not notice others, and we immediately jump to a conclusion. Dr. Northrop spoke to me about the case he describes a few days since. I doubted then, and I doubt now, whether this person was salivated from the red rubber which was worn in that mouth. Dr. Northrop thinks he was. I don't think all the facts of the case are known. But I do not stand here to plead for rubber. Within the last year the publisher of a cyclopædia of family medicine intended for popular distribution and instruction, came to me to write the chapter referring to the teeth. I did so, and at the close I said, "This article would be incomplete without some reference to artificial teeth." I then described the different materials upon which they were placed, giving their advantages and disadvantages as carefully, thoroughly, and conscientiously as I could. After enumerating the advantages of rubber, the ease with which an unskillful person can make a set of teeth which are of use to the patient, I then enumerated its disadvantages, prominent among which I placed its non-conducting property, and the impossibility, almost, in ordinary hands, of keeping rubber absolutely clean. I stated in that article that out of a thousand

sets of teeth that had come into my hands in the last twenty years after they had been worn, I had never seen but one piece that was absolutely clean. Since then I have seen one more. The last one was that of a gentleman who had been salivated and who had lost his teeth; he was wearing an upper set of teeth on a rubber plate. He was particularly careful about himself, as he had passed through a very unfortunate experience some years ago, in which his system was tainted with disease, and he was afraid the disease might reappear under any exciting cause, and consequently any irritation or inflammation of the gums he was guarding against with the utmost care. He had attempted to wear a gold plate, but the extra weight of the gold over that of the rubber was sufficient to prevent his wearing it with entire comfort. He could wear a rubber plate because it was lighter, but he was in constant fear that the rubber plate would create inflammation. Within the last ten days I have examined his mouth, and found it perfectly and absolutely clean. Just as clean and healthy as a babe's, and free from the slightest trace of inflammation. The rubber plate was scrupulously clean. This plate was of black rubber. I have used black rubber and red rubber, and I have seen mouths become inflamed and spongy under black rubber as well as under red rubber, and I have seen them become just as inflamed and spongy under celluloid, and also under gold plate where it was not kept clean.

There died within the last few weeks a prominent man known to you all, for whom I made some years since an upper set of teeth on gold, clasped to two molars, one upon the right and the other upon the left side. There were no other teeth in the jaw. I think I had attempted a suction-plate for him before, but it annoyed him and I resorted to clasps. Five years after that he came to me to have me take out the plate and clean it, as it had not been cleaned in all that time, and had not been out of his mouth. Well, his gums were salivated with red rubber to all appearance, looking as I have seen many a mouth wearing a rubber plate. But a metal plate is more easily kept clean than either rubber or celluloid; besides, being a better conductor, inflammation of the gum is not so likely to occur. I do not find that celluloid possesses any advantage over rubber as regards cleanliness.

Both materials are very difficult to keep clean, and unless they are thoroughly scoured with a stiff brush and from time to time with some such powder as chalk, you can't keep them clean; and I assure you that I believe it is the accumulation of foreign matter becoming foul upon the plate next to the gum, and the wearing such plates night and day, that is causing the trouble that you are attributing to the bisulphide of mercury. Of the non-conducting properties of rubber and celluloid, the advantage seems in favor of celluloid.

Recently I made an upper set on rubber for a clergyman, a valued friend of mine, to take the place of one made by some one else on celluloid. I used the rubber without much thought, other than to make him a more useful piece than he had been wearing. He was not aware that there was any difference in the material, as the old celluloid had become much discolored, but he returned to me in a few days with much anxiety about the dryness and feverishness of his mouth, which was especially annoying in preaching. Something, he said, which he had never experienced before. I made a new set, using celluloid, since which time such symptoms have not appeared.

I close by saying that I believe that the effects which some of you, or some of your scientific men among the medical profession, are charging to poison, are due quite as much to the want of cleanliness and care on the part of the patient as to any bisulphide of mercury there is in the composition of the red rubber.

Dr. O. E. Hill. If I understand this matter the result is simply this. Perhaps one in a thousand cannot wear a rubber plate, perhaps one in a thousand cannot wear a gold plate, perhaps one in a thousand cannot wear a celluloid plate. That is about the truth of this whole matter. That rubber creates trouble generally is not true, that celluloid does is not true, that all or any of them are by a great majority worn with comfort is true. For instance, I know a lady who cannot possibly eat a strawberry. Shall we all stop eating strawberries because they make her ill? I see this thing in just about that way. There are some systems that are peculiarly susceptible to certain things or conditions. That, I think, is one way to look at this rubber and celluloid question.

Dr. C. F. W. Bödecker. One of my patients experienced great annoyance from a rubber plate, which I made about nine years ago. She complained of a feverish condition of the mouth, and of soreness of the gums under the plate. I urged greater care in cleaning the plate, but the mouth still remained in an unhealthy state. I then made a metallic plate, which was worn only a short time when the diseased condition disappeared.

Dr. Perry. Several days ago Dr. Kingsley handed me a copy of his new book on "Oral Deformities," on the title-page of which he had written, "To the Odontological Society, with the compliments of the author." I have no knowledge of many of the subjects treated in this book, but I cannot let this occasion pass without expressing the great satisfaction I have felt in reading the chapters devoted to irregularities of the teeth. They are full of common sense, and I am glad that the young men of our profession can now have access to much valuable knowledge that has not heretofore seen the light.

Dr. Allan. The book Dr. Kingsley has just produced may be said

to be the beginning of oral science literature. I am more pleased with it than with any book pertaining to dentistry I have so far read. It is a systematic and well carried-out attempt to put this whole subject of the treatment of irregularities, fractures, and abnormal oral developments fairly and fully before the profession. Dr. Kingsley deserves great credit and the thanks of all dental practitioners for having given them so thorough and so comprehensive a work. I am quite certain that he will receive a well-merited good word from the medical profession as well.

Dr. Dwinelle. I am glad that we have the opportunity of expressing our acknowledgments to the author of this work for the valuable contribution he has made, not only to the library of our society, but to the literature of our profession. I have read it with a great deal of pleasure, and do not hesitate to pronounce it one of the most valuable, if not the most valuable, literary contribution ever made to our science. I know of no book to compare with it, and, as has been suggested by Dr. Perry, I think the young men of the profession are to be congratulated that so complete a treatise is placed in their hands.

A book that embraces all of the past in the department of which it treats, and posts them up to the present hour.

A book which no member of the profession, either young or old, can afford to be without. We older men had no aids like this. Many of us in our specialties, like the author in his, had to invent each step of our way, often through discouraging failures.

This treatise on "Oral Deformities" marks an advanced step in the ever-widening field of our science and art, encroaching on the domain of the general surgeon, and boldly claiming superiority for its methods of treatment in certain departments.

To the surgeon and general practitioner of medicine, as well as the dentist, its instruction will be found invaluable. It is clear in style, practical in its application, comprehensive in its illustrations, and so exhaustive that it is not likely, in these respects, to meet a rival.

The publishers are to be complimented for the handsome manner in which they have seconded the author's efforts; the fullness of the illustrations and the typographical appearance are worthy of all praise.

The old scriptural proverb says "that a prophet is not without honor save in his own country and in his own house." I rejoice, Mr. President, that we are able to reverse that proverb as applied to our author, and that we may claim him as one of ourselves, a member of the Odontological Society.

I move that a vote of thanks be given to the author for his contribution to our society and to the literature of our profession.

Dr. Abbott. I am aware that it is getting late, but I cannot withstand the temptation to say a word in seconding this motion.

I have had this book of Dr. Kingsley's since its first appearance, have read portions of it, looked it all over carefully, and I must say, without the least hesitation, that I consider it to be the most valuable work that has ever appeared in this country in any department of the science of dental surgery. There is no doubt of its great value to every man who wishes to study and practice this branch of surgery. I hope it may be adopted as a text-book in every dental college, that all students may have the benefit of the great experience of its author.

To me it certainly is a most valuable work, as it places many things between the covers of one book which I have heretofore been obliged to look for in many directions, and often without success. I consider it a most valuable work, and heartily recommend it to the profession.

[A vote being taken, Dr. Dwinelle's motion was carried unanimously.]

The following contribution to the subject announced for discussion during the evening—"Predisposing Causes of Caries"—was handed to the secretary by Dr. Bogue, of the executive committee, and, in the absence of the regular essayist, was read by Dr. Perry :

Among the predisposing causes of dental caries are two which may be said to comprise nearly all the others,—food and shelter.

On these two depend to a great extent the habits, growth, and health of the individual, and, leaving certain accidents aside, they govern shape, size, and position of the teeth.

Upon the shape depends the density of the teeth, or at least the shape and density are interdependent upon each other to a very large extent, as will be at once recognized by all who have ever undertaken to permanently separate the teeth by cutting, and all who have been in practice sufficiently long to have observed the growth of children from infancy to adult age, and to have noted carefully their surroundings meantime.

The physical degeneration which frequently accompanies a sudden accession to a life of luxury has often been noted; and although the type of tooth may be preserved in a succeeding generation, the form is often seen to be more or less altered, and almost always it seems to be altered just in proportion as its density diminishes. To express it more exactly, the dense, yellow, and hard tooth, which lasts out the threescore years and ten of man's existence, is short, well rounded, and narrow from the buccal to the lingual side; has low cusps; is prominently protuberant on the anterior and posterior sides, so that

two teeth of this type brought into contact will touch one another only at a point, and that point is seen to be exactly where the enamel is thickest, and so near the grinding surfaces that food is minutely comminuted before it can be driven through, between the teeth, where it would reach a widely-open space, from which the very action of mastication and of insalivation would mostly remove it. The converse of this is to be found in the frail teeth, which dental art and science (what there is of it) have up to this moment failed to preserve for any very prolonged period.

These teeth are long instead of short, and their cusps are long and broad, instead of narrow, from the buccal to the lingual sides; flattened between the anterior and posterior sides; pearly or white instead of being yellowish, and loose and soft in structure, never dense.

Two teeth of this type placed in contact with each other would present broad flat surfaces, between which food crowds with comparative ease, and when once crowded in is apt to remain. A noticeable feature in connection with these frail teeth is that they are moved easily, the alveolus seeming to be more spongy and yielding in character than that surrounding the dense short teeth first mentioned; and this is naturally to be expected, for the vigorous constitution which builds up dense and strong teeth also builds up a strong bony frame as a part of the same system, while the feeble force that builds up frail teeth makes the skeleton to match.

Here, therefore, we have the two extremes, and we can see at once how a child brought up in the shelter of the house, deprived of the tonic influences of out-door life, nourished with food from which perhaps many of the mineral constituents have been withdrawn, released almost altogether from the necessity of mastication, and altogether from the necessity of work, would find these conditions most strongly predisposing ones to dental decay.

It will still further be noticed by the observing practitioner, that those whose constitutions have developed the poorest teeth are very often indisposed to make the exertion necessary to cleanse the teeth. Constitutional tiredness being another predisposing cause, not only of dental, but sometimes of systemic decay.

Following out the same line of reasoning, it is perfectly easy to see how the person of in-door life, and with little exercise, should be more strongly disposed to decay of the teeth than a person of a more active and out-door life. Hence the predominance of female patients in the practice of every dentist, and this predominance would exist from the causes first given, entirely apart from the question of parturition, which condition, it is well known, produces upon woman generally a decided predisposition to dental decay. There seems, however, to be no good physiological reason why this should be so; and, aside from

the influences which tend to confine woman within-doors, and to withdraw from her that degree of exertion that is necessary to robust health, there probably exists none. The few experiments thus far made, in the way of preventing decay of the teeth of the mother during pregnancy, all go to show that any special augmentation of decay during that period is unnecessary, and that probably an influence may be exerted in favor of better-formed and denser teeth for the offspring by having the mother supplied with an abundance of the nutrient elements, lime especially, during the period of gestation and lactation.

Finally, as if to show that privation in some form of some of the necessary elements of the perfect physical man is at the bottom of the ever-increasing tendency towards dental decay, we have but to notice the provisions of nature for man in his natural state. He kills his prey in the chase out-doors. The exercise gives him an appetite; the fluids of the mouth are found to be alkaline; his food is primitive, and consists of not more than one or two kinds at a meal. The meat is perhaps gnawed from the bones. The roots are similarly disposed of; mastication becomes a necessity; the gums partake of its stimulus as well as the teeth. The development of the teeth in that sort of life being generally regular and under the law of "the survival of the fittest," the fittest show the most beautiful regularity, and the tendency is for like to produce like.

Civilization reverses all this. Some one else does the hunting; a French cook perhaps, rejecting all the tough pieces, the cooking; being well cooked, the food is tender and soft. Society demands that it shall be cut up finely and eaten with a fork or spoon; the number of dishes is greatly increased; the seasoning with which the appetite is tempted is not always the most beneficial, and mastication being so nearly dispensed with, insalivation is imperfectly performed.

In a word, except for speech the teeth are rendered as nearly useless as they well can be by the mode of preparing the food in the most highly civilized communities, and it is an invariable law of nature that any organ persistently disused disappears.

It may be interesting just here to notice the fact that among the Hindoos, whose food is mainly boiled rice, the wisdom-teeth are more frequently absent than among any other people of whom we have knowledge.

Following upon this question of some predisposing causes of dental decay would naturally come the treatment appropriate to combat these causes, but as this would open the door to a very wide discussion, it will be more appropriately deferred to an occasion when it may be considered by itself.

Adjourned.

FIFTH DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK.

REPORTED BY J. CARROLL HOUSE, D.D.S.

THE Fifth District Dental Society held its twelfth annual meeting on Tuesday, April 13, 1880, at Utica, the president, Charles Barnes, in the chair. About twenty members and visiting dentists present.

After routine business the president delivered an address on "Specialties in Practice," also enforcing the value of careful record of interesting cases, and comparison of such records among the members.

At the afternoon session, Dr. G. V. N. Relyea, of Oswego, read a paper upon "Artificial Dentures," discussing the relative merits of the various bases, giving them the following relative standing,—gold, silver, continuous gum, aluminium, cheoplastic, rubber, celluloid. He thought that ere long aluminium would take a prominent place in prosthetic dentistry. He expressed disappointment at the failure of celluloid to realize the hopes which, at a previous meeting, he had expressed for this base, but thought the trouble was in defective working.

Dr. A. B. Cowles, of Rome, referred to a case in which a telegraph operator complained of a peculiar sensation in the wearing of a celluloid plate, akin to a galvanic action.

Dr. S. B. Palmer, of Syracuse, thought it must have arisen not from the material, but from mechanical irritation, by pressure upon some nerve which lay abnormally near the surface. He spoke of using a base plate swaged from aluminium, with the teeth attached to it by vulcanite or celluloid, preferring the latter.

Dr. H. W. Tompkins, of Waterville, read a paper upon "Salivary Calculus, its Prevention and Treatment," setting forth its deleterious effects upon the teeth and gums, giving a general analysis of its composition, the theories of its origin and deposition, and the abnormal conditions of the secretions from which it might be expected to arise. He thought special pains should be taken to educate the public as to the injury resulting from the almost criminal neglect of their mouths in this direction.

Dr. E. L. Swartwout, of Utica, talked of "Riggs's Disease," and of the increased attention now being bestowed upon this pathological condition. Its treatment demands the use of very delicately constructed instruments, specially adapted for the purpose, reaching well down below the margin of the gums, so as to eradicate the very last particle of tartar. This should be followed by the judicious use of a solution of carbolic acid as a mouth-wash.

Dr. Palmer, by request, read some extracts from an article of Prof.

George Watt's, advising the systemic use of vegetable acids to counteract the tendency to salivary deposits.

Dr. Nellis, of Syracuse, opposed the custom of making operations and treatment for salivary calculus gratuitous, as it served to mislead the public as to the real importance of the condition.

Dr. C. B. Foster, of Utica, recommended the use of fine silica on red cedar wood for polishing after sealing.

Dr. Tompkins was of the opinion that fruits in their season should be freely used, but he deprecated the use of canned fruits out of their natural season.

Dr. A. N. Priest, of Utica, advised as a mouth-wash one part of carbolic acid to from forty to sixty of water.

At the evening session, the election of officers for the ensuing year was had, with the following result:

President.—E. L. Swartwout, Utica.

Vice-President.—Charles B. Foster, Utica.

Secretary.—I. C. Curtis, Fulton.

Treasurer.—J. C. House, Lowville.

Correspondent.—G. V. N. Relyea, Oswego.

Censors.—S. B. Palmer, Charles Barnes, and H. W. Tompkins.

Drs. G. V. N. Relyea and George F. Horsey were made delegates to the State society for four years.

Drs. Relyea, Foster, and Palmer were made a committee to report upon the death of the late Dr. S. S. White.

At the closing session, Wednesday morning, Dr. F. D. Nellis opened the discussion of the topic, "Sensitive Dentine and Constitutional Disturbance influencing the Condition of Tooth-Substance." He spoke of the use of carbolic acid, chloroform, and other more recently introduced obtunders of pain.

Dr. L. W. Rogers, of Utica, referred to certain temperaments as distinctly influencing the sensitiveness of dentine. He temporarily fills sensitive cavities with tin, and after a time refills with gold.

Dr. Relyea advised the use of Metcalf's filling temporarily in sensitive teeth.

Dr. Swartwout spoke of the use of glacial phosphoric acid for combating the trouble, but preferred creasote and oil of cloves.

Dr. Cherry recommended lateral pressure on the tooth while excavating, and the use of sharp instruments.

Dr. Nearing thought that tight wedging would accomplish the same result.

Dr. Curtis, as an introduction to the topic, "Fillings and Materials used," read a paper upon the use of the file, accompanied by several diagrams of special cases in practice, with suggestions as to methods of separation preparatory to filling.

Dr. Swartwout tries to secure a good shoulder at the neck of the tooth, and at points of contact, tooth with tooth.

Dr. Cherry did not wish to go before the public as advocating the use of the file.

Dr. Rogers believed in the free, but judicious, use of this useful implement, yet he is careful to thoroughly polish all surfaces after filing. He felt that were it possible to secure perfectly healthy secretions in the mouth, the carious destruction of tooth-substance would to a great extent be overcome.

Dr. Curtis then read a second paper, on "Materials for Fillings, and Methods," advising the use of soft foil in the form of cylinders for the body of the filling, and finishing with cohesive gold. For small cavities he would use cohesive foil; advised the use in suitable cases of Weston's cement; would use amalgam in some cases of frail walls, especially in children's teeth, finishing at a second sitting.

Dr. Relyea, of the committee appointed the previous evening, reported the following preamble and resolutions, which were unanimously adopted:

WHEREAS, We, as members of the Fifth District Dental Society of the State of New York, have learned with deep regret of the sudden and unexpected death of Dr. S. S. White in a foreign land, whither he had gone to seek rest and recuperate impaired health; be it, therefore,

Resolved, That this organization, in common with other similar societies, feels called upon to express its deep sympathy for his bereaved family in their irreparable loss.

Resolved, That in his death the Dental Profession has been bereft of one of its noblest benefactors and best friends; one who, in the prosecution of his extended efforts and by his beneficence, has materially assisted in elevating the status of the Profession of Dentistry.

Dr. J. C. House, of Lowville, introducing the subject of the "Diseases of the Gums and Alveolar Processes," classed them under the following general heads:

First. Eruptive inflammation consequent upon first dentition. Second. Inflammation (*a*), from mechanical irritation, as by tartar, misarticulation, and crowding; also from impacting of food between the teeth, and (*b*), as secondary, upon inflamed pulp. Third. Suppuration consequent upon induced inflammation, complicating the processes and their mucous covering. Fourth. Wasting of the alveoli and recession of the gums from (*a*) irritation, (*b*) from constitutional disturbance by remote disease, (*c*) medicinally induced, (*d*) mechanically induced, and (*e*) heredity.

Dr. Palmer remarked that general causes lay back of these local manifestations, demanding constitutional remedies after tartar deposits are removed.

Dr. Priest explained the Richmond method of inserting gold crowns on healthy roots.

Dr. Curtis spoke of grafting a portion of a mineral crown on the broken front tooth of a young lad, illustrating the same.

Dr. J. S. Marshall, of Syracuse, read a well-digested paper on "Exposed Pulp, with Methods of Treatment by Local Applications and General Remedies," citing cases of practice in illustration.

On motion, the society adjourned to meet at Syracuse on the 12th of October.

ALUMNI OF THE DENTAL COLLEGE OF THE UNIVERSITY OF MICHIGAN.

At the annual meeting of the alumni of the Dental College of the University of Michigan, held at Ann Arbor, March 24, 1880, the following officers were elected for the ensuing year:

President.—W. H. Dorrance, Jackson, Michigan.

Vice-President.—F. O. Gilbert, Bay City, Michigan.

Secretary.—B. F. Miller, Flint, Michigan.

Treasurer.—T. S. Ewing, Dexter, Michigan.

Executive Committee.—Drs. Jackson, of Ann Arbor; Dorrance, of Jackson; and B. F. Miller, of Flint.

B. F. MILLER, *Secretary.*

AMERICAN DENTAL ASSOCIATION.

THE twentieth annual session of the American Dental Association will be held in Boston, Massachusetts, August 3, 4, 5, and 6, 1880. Further particulars will appear in the July issue of the DENTAL COSMOS.

THOMAS FILLEBROWN,
Chairman Committee of Arrangements.

CONNECTICUT VALLEY DENTAL SOCIETY.

THE sixteenth semi-annual meeting of this society will occur at Savin Rock, Connecticut, June 17 and 18 (Thursday and Friday), 1880.

Papers by prominent dentists of this and other countries will be read, interesting clinics, etc. Savin Rock is but five miles from New Haven, on the Sound, readily accessible by beautiful carriage-road, horse-cars, etc.

A. M. ROSS, *Secretary.*

NEW JERSEY STATE DENTAL SOCIETY.

THE tenth annual session of the New Jersey State Dental Society will be held at Long Branch, July 20, 21, and 22, 1880. The Board of Examiners will meet on the 19th inst. for the examination of candidates for license to practice. The profession generally are invited to be present, Long Branch being easy of access, with unsurpassed hotel accommodations. Every attention will be given inventors and dealers in dental appliances for the proper exhibition of their goods. Those so desiring will communicate with Dr. J. C. Clarke, Chairman of the Executive Committee, Jersey City.

CHARLES A. MEEKER, Newark, *Secretary*.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE twelfth annual meeting of the Pennsylvania State Dental Society will be held at Bellefonte, Pennsylvania, on Tuesday, July 27, 1880, at ten A.M., and remain in session three days. Dentists of this and adjoining States are cordially invited to attend.

G. W. KLUMP, D.D.S., *Corresponding Secretary*.

EDITORIAL.

A NATIONAL DENTAL ASSOCIATION.

WE learn that a mass convention is to be called to meet in the city of New York, on the 11th of August ensuing, for the purpose of forming a National Dental Association. At a meeting of a sub-committee, held in New York May 11, a plan of organization was adopted, which, after revision by the full committee, will be submitted to the mass convention, a call for which is to be distributed to the profession in circular form, and published in the dental journals for July.

BIBLIOGRAPHICAL.

SEA AIR AND SEA BATHING. By JOHN H. PACKARD, M.D. No. XI. American Health Primers. Philadelphia: Presley Blakiston, 1880.

THIS timely little book is not a whit behind its fellows in extent of valuable information and advice. The subjects treated of are, indeed, more generally interesting, though not more important, than those of the preceding volumes, and the author has contrived to enhance the interest of his topics by an appreciative and genial style.

The chapter on "Accidents in Bathing" is illustrated with cuts.

This book would serve admirably as a pocket guide, and will, no doubt, be extensively read and consulted by that large and growing class of the community which goes "down to the sea"—not "in ships," but in railroad cars.

OBITUARY.

ACTION OF THE DENTAL PROFESSION WITH REFERENCE TO THE DEATH OF DR. SAMUEL S. WHITE.

THIRD DISTRICT DENTAL SOCIETY.

At the annual meeting of the Third District Dental Society of the State of New York, held in Albany, on Tuesday, April 13, 1880, a committee, consisting of Drs. Rosa, Ames, and Winne, was appointed to draft resolutions expressive of the sense of the society relative to the death of Dr. Samuel S. White.

The committee therefore, in accordance with the above appointment, respectfully present the following:

WHEREAS, We have learned with deep regret and sorrow of the death of our friend and professional brother, Dr. Samuel S. White, in the prime of his manhood, and of his usefulness to the Dental Profession and to humanity; therefore,

Resolved, That we appreciate the upright, conscientious, and earnest services of Dr. White, and remember with feelings of gratitude and admiration his eminent ability, his untiring research, and his candid and generous action in all matters pertaining to the world of professional thought and investigation.

Resolved, That in his death the Dental Profession has been bereft of its best friend and benefactor, and the members of this society fully recognize the obligations American Dentistry owes to the late Dr. Samuel S. White.

Resolved, That our regret for his untimely decease is lightened by the remembrance that his services to Dentistry will insure his name and memory an honorable and distinguished place among those of our profession whom we all delight to honor.

Resolved, That our true and heartfelt sympathies are hereby tendered to the family of our deceased brother in this sad and inscrutable dispensation of Divine Providence.

Resolved, That these resolutions be published in the DENTAL COSMOS, and a copy be sent to the family of the deceased.

(Signed)

HYMAN ROSA,

WM. F. WINNE,

F. LEGRAND AMES,

Committee.

DRS. S. P. CUTLER AND J. C. HARRIS.

At a called meeting of the dentists and the Microscopical Society of Memphis, Tennessee, the following resolution was passed unanimously:

Resolved, That we announce with great regret the death of Drs. S. P. Cutler and J. C. Harris, of this city, and desire to record our testimony to their sterling worth as men and citizens, whose extensive knowledge, ceaseless energies, and probity of character were exponents of, and gave dignity to, the dental profession; and to convey to their bereaved families the assurance of our most sincere condolence.

J. L. MEWBORN, *Secretary*.

DR. WILLIAM S. EVERITT.

DIED, suddenly, of heart-disease, in the city of Charlotte, North Carolina, March 24, 1880, Dr. WILLIAM S. EVERITT, aged twenty-nine years, a native of Goldsboro', North Carolina.

Dr. Everitt was a genial and kind-hearted gentleman, and achieved the reputation of a good operator.

W. H. HOFFMAN.

PERISCOPE.

DIAGNOSTIC SIGNS AFFORDED BY THE TEETH AND MOUTH.—At the meeting of this society on February 18, after the annual address given by the president (W. A. N. Cattlin, F.R.C.S.), Mr. Hamilton Cartwright opened a discussion "On the means of Diagnosis afforded by an Examination of the Teeth and Mouth in the Doubtful Cases of Constitutional Disease." He desired to show how some knowledge of dental lesions might be of the greatest service to practitioners of medicine and surgery, while at the same time the qualified surgeon practicing dentistry might give valuable aid to his *confrères* in many dubious cases. The first subject he wished to draw the attention of the Fellows to was that of neuralgia connected more especially with the head and neck, which he divided into supra-orbital, infra-orbital and facial, mental and cervico-facial. His contention was that there is no such disease as idiopathic neuralgia; that a cause for it is invariably to be found, whether it be in connection with the impressions created on the nervous centers by the ovum in the womb, or by the diseased tooth. He then combated the theory that in ordinary cases there is any degeneration of the *posterior* roots of the spinal nerves, proving his hypothesis by many examples of sudden and complete cure on the removal of an exciting cause of pain. Though the teeth were very frequently the originators of a spurious kind of neuralgia, he thought that they were very often unjustly blamed and sacrificed. In speaking of the *loci* of neuralgic pain he hazarded the theory that the symptoms of neuralgia were in no small number of instances owing to pressure on the main branch of a nerve caused by exostosis around the edges of the foramina through which they pass. He then gave the means of diagnosing between pain due to dental causes and that caused by lesion of the nervous centers, or by that of special nerves, maintaining that by a process of elimination it was easy to prove whether the teeth were at fault or not. He then alluded to the subject of gout, showing that there was a special condition of the

teeth and oral mucous membrane by which the disease might be diagnosed, and even anticipated in hereditary cases. He then entered upon the signs of syphilis seen in the mouth, as those of rickets, phthisis, and dyspepsia, concluding an exhaustive discussion with the signs of scrofula and struma in the glands, laying great stress upon the fact that a lack of knowledge of the elements of dental surgery, such as might be acquired in any general hospital, frequently was the cause of glandular abscesses being treated as scrofulous, and which were entirely owing to causes connected with the teeth. The president thanked Mr. H. Cartwright for the clear and able manner in which he had brought forward a very interesting subject, and quoted several published cases to support Mr. Cartwright's theory that the local cause of facial neuralgia was often to be found in a remote part, and *vice versâ*. He instanced the case published by Sir Charles Bell, in which an ulcer of the stomach had caused facial neuralgia, and others mentioned in Sir Henry Hallford's Essays, in which osseous deposit on the crista galli of the ethmoid bone had produced the same effect. Perhaps the most interesting case he could refer to of pain in remote parts produced by irritation of the pulp or nerve of a tooth, was one published by the late Mr. Sercombe, in which severe spasm of the uterus was clearly traced by experiment to the exposed pulp of a tooth. He thought facial neuralgia was more frequently to be traced to the gouty diathesis and an anæmic condition of the blood than Mr. H. Cartwright supposed, although cases of neuralgia from constitutional causes were by far the most rare, and Dr. Fothergill had shown that they were common in malarious districts. Mr. Francis Mason dwelt upon the importance of distinguishing syphilitic from other diseases of the cavity of the mouth, and remarked that the commonest form of secondary eruptions in that cavity was found in a raised whitish patch, somewhat indented from contact with the teeth, and situated inside the cheek near the angles of the mouth on both sides. He believed that in the true syphilitic sore throat such patches were observed either over the tonsils, or extending as crescentic elevations on the soft palate. If the tongue were affected the patches were chiefly on the sides of the organ, and indented from contact with the teeth. He believed that this peculiar raised condition, due to the effusion of lymph, so characteristic of true syphilis, was much more commonly to be observed than the deep excavated ulcer. He further remarked that it was customary at the present day to attribute all cases of exfoliation of the palate and nasal bones to syphilis. His own experience led him to believe that in by far the majority of such cases there was no history whatever of true syphilis. The president assumed that Mr. Mason attributed necrosis of the bones of the nose and other parts more to the abuse of mercury than syphilis, although he had not actually said so. Mr. Mason agreed that the awful destruction of the bones of the face and soft parts, as occasionally seen in former years, but now, happily, illustrated only in our museums, was due not to syphilis, but most probably to the wholesale administration of mercury for its supposed cure. Lastly he urged the importance of making a correct diagnosis, and instanced some cases in which the mere eruption of a wisdom-tooth had been mistaken for syphilitic sore throat, and had been treated accordingly. Mr. Edgelow considered

that neuralgia had always some positive cause, and narrated a case that had come under his notice at St. George's Hospital in which exostosis of the root of a tooth had caused severe pain in the hand, which subsided at once on the extraction of the tooth. Mr. Ranger stated that in two cases which he had recently met with at St. Thomas's the same result followed. The first case was that of a young man who suffered extreme pain in the right arm and down to the hip-joint. He found a lower bicuspid very much decayed, and on destroying the pulp with arsenic the pain ceased almost immediately. The other case was that of hysteria in a girl, when on removing a lower bicuspid, much decayed, the same result followed. —*Association of Surgeons practicing Dental Surgery, in Lancet.*

DIFFICULT DENTITION.—Dr. Buckingham read a paper on "Difficult Dentition."*

Dr. Porter alluded to the groundless fear, so wide-spread among the laity, that the cicatrix resulting from lancing the gums is more difficult of penetration by the tooth than the gum which has been let alone. He then spoke of the happy effect of bromide of potassium in full doses in cases of irritation from teething, the drug proving often all-sufficient without resort to the lancet. Dr. T. B. Curtis remarked that it was very difficult to form conclusions as to the benefit of gum-cutting, so greatly do the authorities and the experience of individuals differ on this point. He never did it, perhaps having got a prejudice against it from the days when he was interne of Roger at the Hôpital des Enfants Malades in Paris. He remembered hearing Roger express the opinion that the dangers from teething and the effect of worms were greatly overrated, and never did he hear Roger even suggest performing the operation. In one case he had a chance to compare the methods. A child which had been under his care never had its gums cut, until one summer, during his absence from town, it came under the care of another practitioner, who cut the gums several times. Neither the mother nor the nurse could perceive any benefit from the procedure. Jacobi† thinks it not only useless, but even harmful to the teeth, as does also a New York dentist, J. Foster Flagg, quoted by Jacobi. Dr. C. E. Stedman said that the paper is an indication of how industry and research will give interest to a well-worn subject. He always carries a lancet, and feels satisfied that the operation is useful. One who has seen a child look up in his face and laugh after the operation is struck by its perforce. He has never regretted the operation save in one case, in which there was free bleeding from the gum, perhaps from clumsiness on his part. In regard to artificial food, he thought Borden's condensed milk perhaps the best single thing. At a meeting of county physicians, some fifteen years since, he was much struck by the unanimity which seemed to prevail in favor of condensed milk. Dr. Buckingham said that in his experience it is easier to get good milk in the city than in the country. The very fact that city milk is a mixture from many cows is a safeguard. Dr. Rotch thought the paper especially valuable from a clinical point of view, and was reminded by it of the case of a child nine months of age who had had some difficulty in cutting

* Vide Journal, vol. cii. p. 3.

† Buck's Hygiene and Public Health, vol. i. p. 136.

the lower incisors at eight months. The child began to suffer from pain, was sleepless, cried persistently, and had fever. Bromide of potassium and breast milk were rejected; the temperature rose to 104° F., and there was retention of urine. After twenty-four hours the gums, which were swollen and tense, were lanced. Within two minutes after this the child fell asleep for twenty minutes. Its temperature was then 102° F. After another hour the temperature was normal; the child nursed, and had no further trouble. Dr. Rotch asked the reader whether, in his researches, he had met with physiological facts or experiments going to show that the number of teeth is any index of the capacity for digesting starchy food. The reader replied that he had not. Certain authorities express their opinion regarding it; Monti, for instance, speaks of eight teeth as necessary, the late Dr. Buckingham of sixteen. Dr. Vaughan expressed his conviction that relief is afforded by gum-cutting. One of his own children came to him and asked for the operation as plainly as possible. In but one case has he seen a tooth injured thereby, a lower incisor, which decayed early. Dr. J. S. Greene spoke highly of the application of ice to the gums; it is very grateful to the children, and has often saved him from the use of the lancet, which he uses still, but not as often as formerly. Dr. Porter recalled the case of a child which had been in apparent pain for forty-eight hours, was restless, and would not leave its mother's arms for the crib. The gums were swollen, so he lanced them in four places, and before he could wipe his lancet the child was asleep. So soundly did it sleep that the mother was alarmed, and feared that it was dead. There was no further trouble at that time. He has always lanced the gums of his own children when swollen and irritated. Dr. F. C. Shattuck said that he had never performed the operation, never having seen a case in private practice or in a large dispensary and Massachusetts Hospital out-patient experience in which it seemed to him indicated. Dr. Doe spoke of a child who had had convulsions with every tooth unless an incision was made. That the relief was due to the incision was shown by the fact that in his absence another physician was called in during the convulsion: bromide of potassium gave no relief. Soon after Dr. Doe arrived, lanced the gums, and the convulsion ceased.—*Proceedings Boston Society for Medical Observation, in Boston Medical and Surgical Journal.*

REFLECTED NEURALGIA.—In July last year I filled an upper bicuspid for a lady with osteo cement. The tooth had a very large saucer-shaped cavity on its mesial surface, extending also to the palatal side, the cusp here having disappeared.

The cavity was not particularly sensitive, and as it had been present for some time, and was of such a shape that food had not lodged in it, and as there seemed to be a layer of secondary dentine over the pulp, I ventured to fill it at once. Unfortunately (as it proves), I did not put anything between the osteo and the region of the pulp, yet very little pain was caused in the process.

On the 1st of February I received a note from the patient saying that she had been advised by her medical man to have her mouth examined to see if there could be any dental cause for the extreme pain she had suffered in her head. The pain was described as being in the temporal and parietal regions, by the side of the nose, in the

eye, but especially near the articulation of the lower jaw, in fact in the region of Meckel's ganglion, but there was *no pain whatever* in any *tooth* or in the dental region.

The patient said the pain had only been acute for about three weeks, had resisted all treatment, had caused sleepless nights, and came on apparently without reason, usually, however, on changing the temperature by going out of or in doors, and it was unilateral.

On examining the mouth, I found no fresh decay, no exposed nerves, and no erupting wisdom-tooth. The bicuspid I had filled was a trifle loose, but *not* tender on pressure; a lateral, also with a very large stopping, did not give any indication of being the cause of the pain.

The patient stated that in July the bicuspid had ached for two or three days, but after that no pain whatever had been felt *in the tooth*. This fact of pain after stopping led me to decide on removing the white filling. On the last fragment coming away the patient shrieked with pain, and I found a highly inflamed point of exposure of the pulp with visible pulsation; the chief pain, however, was still in the ganglionic region.

The tooth was dressed with light wool and mastic over carbolic acid, and left for a few days, during which time, however, pain was felt; and then I gave the patient the option of having the pulp destroyed *versus* extraction. She unhesitatingly decided on the latter, and as the size of the cavity and the violence of the general neuralgia justified this course, I adopted it, and was rewarded by a complete cure of all the reflected pain.

An obvious moral is to be deduced from this case: to protect the pulp, if nearly exposed, from the direct contact of osteo fillings; and in cases of reflected neuralgia, to be on the look-out for stoppings which may possibly be a cause of nerve-irritation.—*S. J. Hutchinson, L.D.S., in Monthly Review of Dental Surgery.*

CASES OF TUMOR OF THE ANTRUM OF HIGHMORE.—CASE 1. *Collection of Inspissated Pus in the Antrum simulating a Morbid Growth.*—A. E., aged forty-three, housewife, was admitted on June 3, complaining of pain and swelling of the left side of the face. There was an ill-defined swelling over the region of the left upper jaw, and the angle of the mouth on that side was drawn downwards. The swelling was both hard and tender; the skin over it appeared unaffected. In the mouth there was a tense, elastic, and tender swelling over the left half of the hard palate, displacing the alveolar process downwards. Slight discharge oozed from a small opening in the mucous membrane opposite the last upper molar tooth, the swelling being softer about this spot than elsewhere. The left nostril was blocked, its external wall being pushed inwards, and the patient complained of some discharge from it. The neighboring lymphatic glands were not enlarged, and with the exception of occasional pain in the tumor, the patient suffered no inconvenience, her general health being excellent.

She had noticed the swelling for about two years, and its commencement was attributed to exposure to cold. At times the swelling increased, and became more troublesome, especially after prolonged overwork. No history of syphilis could be obtained, and her family history was good.

On June 5 Mr. Heath made an incision through the upper lip in the median line, prolonging it into the nostril of the affected side. The alveolus and hard palate having been divided with saw and bone forceps, a way was made into the latter, and a pultaceous, offensive mass, about the size of a hen's egg, was turned out with the finger. On microscopical examination this was found to consist of fatty debris, granular pus-cells, and acicular crystals. As the larger portion of the left half of the hard palate was partially loosened and absorbed, it was removed with the forceps. The cavity of the wound was stuffed with a strip of lint to prevent any hemorrhage, and the edges of the incision in the upper lip brought together by harelip pin suture.

The patient made an uninterrupted recovery, and was discharged from the hospital on June 22.

CASE 2. *Soft Fibroma of Antrum.*—J. P., aged twenty, domestic servant, was admitted on July 1, 1878. She stated that she first noticed a swelling of the right side of the face in 1874. The swelling never entirely subsided, and gave her more or less pain. In 1877 a swelling appeared in the roof of the mouth, accompanied by copious and offensive discharge. At this time the patient suffered from toothaches, referred to the right upper molar teeth, which were consequently extracted. Relief was thus obtained for a month or so, but the tumor gradually increased in size, and at the time of admission the pain had become much more severe, and was almost constant. There was likewise a uniform swelling of the right side of face, the malar bone and adjacent parts of the superior maxilla feeling fuller than the corresponding parts of the left side. In the mouth the growth involved the right upper alveolar process, the second molar being in the center of the swelling, and quite loose; its inner margin corresponded with the inner edge of the alveolar process; externally it merged into the swelling of the antrum, and was here soft, elastic, and irregular. On examination with the finger, the posterior nares were found to be free; there was no discharge from either nostril, nor any evidence of implication of the right orbit, or of the neighboring lymphatic glands. The heart was slightly hypertrophied, and a presystolic murmur was audible, but other organs apparently healthy. Her general health was fair.

On July 3 an incision was made into the antrum from beneath the lip, and a mass of new growth was turned out with the finger; but a rapid recurrence having taken place, the whole of the upper jaw was removed on July 17. The bleeding occurring during the operation was arrested partly by ligature, and partly by Paquelin's thermo-cautery. The edges of the incisions (one through the upper lip into the right nostril, another begun near the inner angle of the orbit, and carried down by the side of the nose around the ala, so meeting the first) were brought together with harelip pin and silk sutures, and painted over with collodion.

Examination of the parts removed showed that the growth was limited to the antrum, and had been completely extirpated. It was of a pale-yellow color, and almost gelatinous in consistence. Microscopically it consisted of wavy interlacing bands of fibrous tissue, in the midst of which a few spindle-shaped and round cells were visible.

With the exception of slight hemorrhage from the cavity of the

wound on July 25, the patient made an unretarded recovery, and was discharged from the hospital on August 21.

She was seen on October 25, appearing in excellent health; beyond a little sinking in of the right cheek scarcely any trace of the operation was visible.

She was again seen in May last, and with the exception of some inconvenience arising from badly-fitting artificial teeth and palate, was free from pain, and in good health.—*University College Hospital Reports, in Lancet.*

EXCISION OF THE UPPER JAW.—David J., aged fifty-four, sailor, was admitted into hospital on October 8, 1878. Three years before he fell a considerable distance on his face, severely injuring his right eye, of which vision was entirely lost. Since then there has been a gradually increasing swelling of the right side of the nose, with a constant, sometimes profuse, sero-sanious fetid discharge from the right nostril. The swelling of the nose had been increasing rapidly lately. On admission, there was much enlargement of the right side of the nose and cheek. Over the malar bone suppuration had commenced. The skin was thin and gave way, discharging thick pus. There was no affection of the glands, but he was in a low state of health and in constant pain. The right nostril was completely blocked by the growth, and the septum was pushed to the left. In the mouth the tumor slightly encroached on the middle line and extended back to the soft palate.

Operation, October 17. He was put under the influence of ether, given by Ormsby's inhaler, but when the operation was commenced chloroform was used. Fergusson's incision was followed from the center of the lip to the outer margin of the orbit, and the flap turned downwards and outwards. The superior maxillary bone was removed with the orbital plate, the palate-bone, and part of the malar bone. The tumor had no adhesions to the septum nasi, nor to the soft palate. The ulcerated portion of skin under the orbit was excised, and the thermo-cautery used when there was oozing or any suspicious tissue was seen. The whole line of incision was sutured. The operation lasted one hour.

His history subsequent to operation was entirely favorable, the only trouble being a small sinus under the orbit which had to be freely incised. His power of swallowing liquids was always good, but even two months afterwards he had difficulty with solids, which were retained in the nasal vault. His speech also was very indistinct.

Six months after the operation there was no appearance of any return of the disease, but there was considerable retraction of the skin of the cheek. His speech and swallowing powers had been perfectly restored by a false palate and upper jaw, kindly prepared for him by Mr. Phillips, of Rodney Street.

The tumor was examined by Mr. Rushton Parker, and was found to be a form of growth of great interest and rarity. It is described by Billroth* as glandular carcinoma of the nasal mucous membrane,

* "Mucous Glands, with Cylinder Epithelium" (Billroth's "Surgical Pathology," Sydenham Society's Translation, vol. ii. class 9).

and is, fortunately for the patient, said by him not to be likely to recur.

Mr. Phillips has written the following note on the mechanical difficulties which he had to overcome, and a description of the way in which the plates were made and fixed.

Having examined the mouth and taken impressions of the jaws with plaster of Paris, I found that in the left upper jaw (the right having been removed from the median line) there were the roots of the central and lateral incisor and canine teeth, the second bicuspid and first molar being absent, thus leaving only the first bicuspid and last two molar teeth. In the palate there existed an opening of a pear-shape, the broad extremity being towards the throat, the anterior extremity being situated just behind and rather to the right side of the median line, at the junction of the alveolar and palatal processes of the superior maxillary bone; the greatest width of the opening was seven-eighths of an inch and its length one and a half inches. In the lower jaw the patient had all his own teeth with the exception of the second molar and wisdom on the left and the first molar on the right side. There being no means of support for an upper frame alone, it was necessary to construct a lower also, by doing which I was enabled to connect the upper to the lower by means of springs, and thus insure its being kept in position. The lower frame was constructed of vulcanized India-rubber, carrying one artificial tooth to replace the lost second molar on the left side, and being strengthened by means of a strong gold wire imbedded in it, and having also broad metal bands passing round the two remaining molars on the right side and round the first molar on the left. The last came from behind, passing as far forwards as the second bicuspid and having soldered on its extremity a swivel for attachment of the spring on that side, the swivel on the other side being fixed in the piece of the India-rubber that occupied the space of the absent first molar. The upper frame was made chiefly of vulcanized rubber, strengthened or rather replaced over part of the alveolus, where thinness was required, by a piece of plate (palladium). There were also broad metal bands round the two remaining molars to give steadiness. The swivels for attachment of the springs were fixed in the rubber on the right side, a little above and towards the posterior border of the second (artificial) bicuspid, and on the left in the portion of rubber which occupied the space left by the loss of the second bicuspid and first molar. This frame carried the full complement of teeth necessary to antagonize all the lower ones; it was necessarily of somewhat bulky appearance when out of the mouth, owing to the loss it had to replace. The effect was satisfactory, the patient being able to speak distinctly as soon as the frames were inserted; and when I saw him a short time afterwards he told me he could masticate very well and take fluids with comfort, though a little fluid would find its way into the nasal cavity by passing between the cheek and buccal surface of the upper frame, the tissues of the cheek being continuous with the external border of the opening in the palate. I saw the patient again nearly three months afterwards, to replace the springs which had been bent, and he was then apparently quite comfortable.—*Reports of Northern Hospital, Liverpool, in British Medical Journal.*

CURE OF TRAUMATIC SALIVARY FISTULA.—Dr. Henry Morris read notes of this case, as follows: A shoemaker came under his care in the Middlesex Hospital, on June 24, 1879, bleeding from several incised wounds, one of which was about two inches long, and vertical in direction, along the right cheek. On June 28, saliva was seen trickling from the lower end of this wound, which was all but healed. The patient now stated that since the injury the right side of the mouth had felt very hot and dry, and that he had constantly to moisten it by carrying the fluid from the left over to the right side of his mouth. A fine catgut bougie was introduced at the oral aperture of the duct, and passed onward towards the parotid gland until it emerged on the cheek through the fistula. The newly-healed wound was laid open, and the proximal end of the injured salivary duct searched for, and found by squeezing the parotid gland until a little saliva was forced out of the duct. Into this the point of the bougie was inserted and pushed onward for about half an inch. The edges of the wound were brought together with three harelip pins and twisted sutures, and the bougie cut short, so that the short end, not long enough to be caught between the molar teeth, was left protruding into the mouth from the slit-like orifice of the duct. The patient at once appreciated a marked difference in the feeling of the right side of the mouth, which was now in all respects like the other side, and he could distinctly feel saliva trickling into it. On July 4 the bougie came away accidentally. The wound on the cheek had been all but healed for four days, but a little discharge still escaped at its lower end. On July 9 a little saliva was still escaping; cotton-wool and collodion were therefore applied over the wound until July 15. By this date the wound was securely healed and all the saliva flowed freely into the mouth. The man was retained in the hospital for a few days longer, and was then discharged well. The facility with which a bougie could be passed along the parotid duct from the mouth encouraged the author to think that the same treatment would prove successful in most cases of parotid salivary fistula, meaning by "salivary fistula" a fistula of the parotid duct, as distinct from a fistulous communication with the parotid gland itself, such as occasionally followed abscesses below or behind the ear; and also as distinct from an opening into the cavity of the mouth, such as sometimes occurred after necrosis of the jaw and in cancer. If the orifice of the duct, which was its smallest part, became obstructed after long disease, the mucous membrane of the cheek might be punctured, and then a bougie might be passed into the dilated part of the duct, which was just where it pierced the buccinator muscle, and urged along it beyond the fistulous opening. In operations for the removal of tumors of the face, when an incision must be made so as to divide the duct, it would be well to pass a parotid bougie while the patient was still under chloroform, so that the patency of the duct and the flow of saliva into the mouth might be secured during and after the healing of the wound.—*Reports Clinical Society of London, in British Medical Journal.*

FRACTURE OF UPPER AND LOWER JAWS.—A case lately came under my notice which I think will be of interest to the surgical and dental professions.

Madame S., a performer on the trapeze, etc., in London, met with

an uncommon accident, which might have been attended with more serious consequences had there not been a net beneath her into which she fell. On August 23, while going through her usual performance, part of which consisted of swinging by a wire rope, with a leather attachment between her teeth, bearing the whole weight of her body (twelve stone) on her jaws, the wire rope, coming in contact with some other part of the apparatus, became entangled, and then disengaged with a sudden jerk, fracturing both upper and lower jaws, extending from canine to canine in the upper jaw, and including both canines in the lower jaw, the whole depth of the alveolar borders being broken. The teeth and the outer plates were brought nearly at right angles to the maxillary bones. There was considerable hemorrhage for some hours after the accident, but apparently the dental nerves and arteries were intact, as also the body of the lower jaw.

She was immediately after the accident conveyed to the surgery of Mr. Hayes, dentist, St. Martin's-lane, where he and I adjusted the fractures, and, instead of treating the case on what is known as Thomas's principle, with wire sutures, Mr. Hayes took impressions of her mouth, and at once made vulcanite supporting frames, which kept the parts in apposition (without causing any inconvenience) by encompassing low down at the gingival border the whole of the teeth, including the posterior molars, and leaving apertures for the points of the teeth to protrude, except the bicuspid, which were thinly bridged over with vulcanite to keep pressure from the fractured parts. It should be mentioned that there was considerable ecchymosis into the cellular tissues of the neck and lower part of the face, evidently due to subcutaneous laceration by the violence of the jerk.

The case made good progress, without a bad symptom, much to the satisfaction of the patient, who was afraid she would have to lose the teeth affected by the injury. Not having seen any account of treating fractured jaws in this way, I deemed that a record of it would be of interest.—*Walter Norman, M.R.C.S.E., in Lancet.*

DISINTERMENT OF ANCIENT SKULLS, REFERABLE TO THE TENTH CENTURY.—A quantity of human remains were discovered in the vicinity of the celebrated village of Donnybrook early in the month of October, 1879. . . . The discovery was made owing to necessary excavations for building purposes. . . .

In the center of a grass-covered field, underneath a slightly elevated mound of circular form, lay a great multitude of human skeletons,—in fact, several cart-loads were removed and re-interred within Donnybrook church-yard. They lay piled over each other, so far as could be ascertained, over the whole extent in three superimposed layers closely packed together, the lowermost stratum rested upon the surface of the original tough yellow clay soil; into this some of the bones had sunk slightly, becoming imbedded in it, but there was no indication of grave or any excavation for purposes of interment, properly so called. In the course of time, as decay advanced, these three layers of human bodies had become reduced to a stratum not exceeding sixteen inches in depth; over this had been placed as a covering about twelve inches thick of clay, and in fresh sections it was easy to distinguish this layer from the undisturbed original soil; above all was resting eight inches or so of firm grass sod, that appeared never to have been disturbed or plowed. I ascertained by

measurement that the entire of these slain bodies, with few exceptions, were resting within a circle of fifty feet in diameter, and the total transverse width of the tumulus or clay mound did not much exceed one hundred feet; within this limited space were gathered into a heap possibly upwards of five hundred human skeletons. . . .

When the excavations advanced southwards into the mound as already mentioned, we ascertained that a great number of human skeletons were contained within it. It included the bones of men and women and children of every age, from the unborn infant to advanced senility, evidenced by finding toothless jaws with absorbed alveolar tissue. Having one day gathered for the purpose all the adult sacral bones that had turned up for some hours of digging, they were examined carefully and measured, and it was found they represented both sexes in nearly equal proportion. The discovery of such quantities of female bones, and those of children and aged persons, at once showed this must have been a massacre, and not a battle. . . .

There were numerous remains of young children, aged from one to nine years; their lower jaws presented every stage of infantile dentition; and from this onwards to youth and perfect maturity, until the last molars are found completely developed, a large series were gathered together. The teeth, as a rule, are found to be unusually strong and healthy. But toothache was not altogether unknown, and sufficient examples of diseased roots, and even a perforation of the jaw-bone from abscess at the root of a tooth, could be recognized. The worn-down condition of the grinding surfaces of these teeth was most remarkable; they show an amount of attrition altogether unknown at present in the British Isles; of course this is best seen in mature jaws, and during advancing life. Excessive attrition is common to all races that use food requiring a considerable degree of mastication; thus it occurs both in those who employ corn ground in hand-querns, in which it becomes mixed with more or less of the sand from the mill; and it has likewise been noticed in tribes that live upon fish diet almost exclusively, as in the neighborhood of Vancouver's Island. There were further, as I have stated, several jaw-bones that had belonged to persons of considerably advanced age, where the teeth had almost or altogether fallen out, and in which the bony alveolar tissue was absorbed, and had disappeared both in lower and upper jaws.—*William Frazer, F.R.C.S.I., in Medical Press and Circular.*

RETARDED ERUPTION OF SOME OF THE TEETH.—Dr. Williamson related the case of a woman over fifty years of age, who presented apparently an entirely edentulous gum in both upper and lower jaws. The alveolar portion of the lower jaw was entirely absorbed, the ridge being almost on a level with the floor of the mouth. In the center of the ridge, in front of the frænum, was seen a dark body about half an inch in length, the surface of which was for the most part irregular. It was found to be formed by the crowns of the two lower canines, which were lying horizontally, the right being more perpendicular than the left and overlapping it slightly. The right canine was carious to a great extent. The left, though stained and discolored, was sound. The two teeth were firmly imbedded in dense bone, and could not be removed whole by the forceps and elevator. The root of the right one gave way, leaving the

canal freely open, and thus allowing the escape of pus; and so further attempts at removal were not considered necessary. Dr. Williamson said that such cases of malposition were much more common in the upper jaw, the reason being that the upper front teeth were much larger than the lower, and required more space.—*British Medical Journal*.

CONSEQUENCES OF ENLARGED TONSILS.—The pultaceous secretion which blocks up the diseased follicles that honeycomb the hypertrophied glands, if long retained, becomes putrescent. Hence the air becomes tainted in its passage to the lungs, and the patient lives in an impure atmosphere. The food, in its passage through the throat, carries with it a quantity of morbid secretion, which rapidly sets up dyspeptic symptoms, and being absorbed induces mal-nutrition. If the tonsils enlarge towards the median line, the faucial opening is often markedly reduced in size, so much so as to induce mechanical dyspnoea, or even interfere with deglutition. Enlargement downwards may even prevent phonation. Enlargement upwards may obstruct the posterior nares, or compress the Eustachian tubes. Owing to the passage of a less quantity of air through the nasal and oral passages in the conditions mentioned, a diminished volume also enters the larynx and lungs. As a result, in children, the nasal passages do not increase in capacity proportionately with the growth of the child, the alæ of the nose sink in. The palatine arch, also, is so retarded in its growth, that the alveolar process of the upper jaw is small and the teeth crowded. Hence the olfactive and gustatory senses are restricted. Pigeon-breast is induced, noisy breathing, stupid appearance, half-open mouth, liability to the extension of catarrhal processes to the larynx and nares. By these several means nervous energy is diminished, and normal physical development retarded. The prevention of all this trouble consists in the excision of the hypertrophied tonsils.—*Medical Record*.

UNILATERAL DISLOCATION OF LOWER JAW DURING TOOTH-EXTRACTION.—A man about twenty-eight years of age came into my principal's surgery and asked me to draw him two teeth. On asking which they were, he pointed to a right lower incisor and upper bicuspid. I extracted the lower incisor first, using very little force. After the operation was over I perceived that the patient could not close his jaw. On examination, I found a well-marked hollow in front of the left ear, indicating dislocation on that side. I at once reduced it by the ordinary method. The patient being very anxious that I should extract the upper bicuspid, I did so, and unilateral dislocation of the left side happened again. One would naturally suppose that great force was used; but such was not the case. I have had considerable experience in tooth-drawing, but never saw or heard of an accident of this kind happening during the operation.—*Wm. J. Beatty, in the British Medical Journal*.

DENTIGEROUS CYSTIC TUMOR.—Mr. Stokes showed an example of a dentigerous cystic tumor, or membranous cystic growth, which he had removed by external excision from the inferior maxilla of a lad aged fifteen. The growth probably owed its origin to the irritation of a carious tooth. The tumor was lined in its interior by a thick

leathery membrane, from which a honey-like fluid was secreted. The patient recovered without any deformity.—*Reports Pathological Society of Dublin, in the British Medical Journal.*

ALTERATION OF THE MAXILLARY BONES IN ATAXY.—At a recent meeting of the Société Médicale des Hôpitaux de Paris, M. Vallin stated that he had observed, during the course of locomotor ataxy in several patients, a loss of the teeth, which takes place without caries or pain. An osseous atrophy of the alveolar border occurs, on account of which the tooth drops spontaneously out of its socket. There is thus a trophic alteration of the maxillæ, not previously described, which, moreover, merits attention, since it may be an early phenomenon of the disease. The communication of M. Vallin was confirmed by some cases related by MM. Luys and Tereboullet.—*Medical Press and Circular.*

EFFECT OF SUGAR ON THE TEETH.—If we are to believe M. Lerez, whose views are published in the *Charleston Medical Journal*, the ancient prejudice against sugar is not without good ground. The conclusions of M. Lerez are as follows: "1. Refined sugar injures teeth—either by immediate contact, or by gas developed in the stomach. 2. That a tooth soaked in sugar-water becomes jelly-like, from the sugar combining with the lime of the tooth."—*Medical Press and Circular.*

LOCAL USE OF CHLOROFORM IN DENTISTRY.—Dr. Schaffer, speaking from an extensive experience in tooth-extraction, states that the local use of chloroform forms a most admirable preventive of all subsequent hemorrhage or other ill consequences, and hastens the contraction of the wound in the gums. He strongly recommends it as a "mouth-wash," acting as it does in all affections of the gums and teeth as a disinfectant, anodyne, and corroborant. The formula he uses is: spirits of wine one hundred, and chloroform five to ten parts, peppermint oil five to ten drops.—*Wien. Med. Woch.,—Medical Times and Gazette.*

ON MENTHOL AS AN ANTI-NEURALGIC.—Mr. A. D. Macdonald extols the virtues of this substance, which is a volatile solid obtained from Chinese or American oil of peppermint, as a remedy in the various forms of neuralgia. The solution he uses is the following: Menthol, gr. j; spt. vini rect., ℥j; olei caryoph., ℥x; mix. To be shaken and painted over the affected tract. Pain is in this way relieved in from two to four minutes, and within a minute or two more the attack ceases. In toothache, the author has cleaned out the cavity of the tooth with a little cotton-wool, and then placed a single crystal on another small piece of wool and inserted it, with the result that the pain instantly disappeared. A tincture of the strength 1 in 50 is equally effective. Mr. Macdonald recommends menthol as a suitable external application in sciatica, intercostal neuralgia, and brachialgia.—*London Medical Record.*

NERVE-STRETCHING OF THE SUPRA-ORBITAL IN NEURALGIA.—Dr. Masing relates (*Petersb. Med. Woch.*, December 20) the case of a woman, sixty years of age, who suffered for some years from fearful facial neuralgia, almost every branch of the fifth pair being implicated. No remedy had afforded other than temporary alleviation,

and when she came under the reporter's care he determined to try the effect of stretching the supra-orbital nerve as being the only one of those implicated that was accessible. This was done January 30, 1879, the nerve hanging in a loop outside the orbit, and from that time all the most terrible symptoms ceased, and the patient progressively improved, so that by October 6 she was pronounced completely well, having undergone a relapse, brought on by cold, in April, which a few eight-grain doses of quinine mastered.—*Med. Times and Gazette.*

CHLOROFORM.—“If I were about to be placed under the influence of chloroform, I would say, never mind my pulse, never mind my heart; leave my pupil to itself; keep your eyes on my breathing; and if it becomes embarrassed to any extent, take an artery forceps and pull my tongue well out.” It is claimed that the late Mr. Syme faithfully observed this rule and never lost a case, although he had administered chloroform five thousand times.—*Dr. Hughes, in London Lancet.*

NEW CEMENT FOR FILLING TEETH.—It consists of the pyrophosphates of calcium and barium, with that of zinc or magnesium, and is made by Rostagni by fusing together in a crucible calcium phosphate and zinc phosphate, pouring out the mass, powdering, dissolving in dilute phosphoric acid, and evaporating to a syrupy consistence. The liquid is mixed with a powder prepared by triturating 3 kilograms zinc oxide with from 5 to 50 grams boracic acid and a little water; the mass is dried, heated to redness for a few hours, and, after cooling, is powdered. For use the powder is formed into a paste with water.—*Dingl. Journal.*

TO REMOVE PLASTER OF PARIS FROM THE HANDS.—A very effectual way of removing plaster of Paris from the hands is mentioned by a correspondent of the *Boston Medical and Surgical Journal* as being employed in St. Thomas's Hospital. It consists merely in the use of white of egg instead of soap in washing the hands. The fact will interest those who have much to do with plaster dressings.—*Chicago Medical Times.*

HINTS AND QUERIES.

“He that questioneth much shall learn much.”—BACON.

CORRESPONDENTS desiring a reply in this department are requested to make use of *distinctive signatures or initials*, and avoid the practice of signing their communications Reader, Subscriber, etc.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names. We cannot insert queries or replies except they are so accompanied. Names not necessarily for publication.

WILL some one please tell me the readiest method of amalgamating the zincs of my battery?—W. H. I.

WILL some one be kind enough to inform me of the easiest method to remove the tin foil from the surface of a celluloid or rubber plate after vulcanizing?—I. T. E.

I HAVE a patient who complains that her artificial teeth make such a noise when eating that it can be heard around the table. Can any one tell how to prevent the difficulty, or to remedy it?—L. H. R.

Is it honest dentistry to remove an amalgam filling which has done good service for ten years in a bicuspid tooth (but now needs a little mending) and then fill the cavity with gold, and because the gold tumbles out at the last finishing touches, catch up the forceps and extract the tooth?

This is a question for those who never use amalgams.—HENRY S. CHASE.

A PARTIAL ANSWER TO "CALCIUM," in the May number of DENTAL COSMOS.—We have every reason, both theoretically and experimentally, to believe that lime as found in water or earths will not nourish either the bones or the teeth. It is the province of the vegetable kingdom to vitalize lime to such a degree that the animal world can appropriate it for building up tissues. It is the lime found in vegetable grains, as wheat, corn, oats, etc., that will nourish animals. Bone-dust, or bone-lime, will nourish animal tissues because it has been vitalized in the vegetable and afterwards vitalized in the animal.—HENRY S. CHASE.

DARK JOINTS.—Of the various plans given in the April number of the DENTAL COSMOS for the prevention of dark joints in rubber-work, that recommended by C. W. Danforth is undoubtedly the best. It aims at the complete closing up of the joint in every part, so that no rubber can possibly get in. I reach the same result in a different way, without removing the blocks, and have not had a bad joint for years. I rely upon oxychloride of zinc, mixed rather thin and worked in with an extremely delicate, thin-bladed spatula, made for the purpose out of an old excavator. But I apply the material *outside* as well as inside; that is, to the labio-buccal as well as to the lingual sides of the joints. Grind off a *very little* of the sharp enamel edges bordering the joints, so that when the blocks are in place there will be a delicate enamel along the whole outer extent of each joint. Fill these with the oxychloride. The blocks should be fastened at the top by their centers only, making the wax stop short of the joints till the canals are filled. Then finish the waxing-up, and flask as usual. But the wax should always be used cool enough about the joints so that it will bridge them over, and not run into them. On opening the flask, remove the wax (I use hot water for the purpose) and apply the oxychloride as before. Give the material plenty of time to harden. In order to prevent the blocks from starting, it is better to let the case stand over night; but if the packing must go on while the plaster is comparatively green, due allowance should be made, and the force applied very slowly and gently.—M.

IN the DENTAL COSMOS for April and May, D. D. S. called forth several answers to his query, "How to prevent the joints of block teeth from becoming disfigured by rubber," and, as they each differ from a plan I adopt, I will give it. I think it will prove upon trial to be the best. It is out of reason to expect any dentist to make all joints water-tight, which they must be to be rubber-proof, but every one can make a fairly good joint. This is all that is necessary, if in melting the wax over the pins you avoid melting it into the joints. Previous to pouring the plaster which is to invest the blocks wet the joints, and the plaster will find its way through the joints to the wax, and if in excess at the back of the blocks, trim even with the same. When the plaster is being poured, give the flask a good jolting. These directions followed, you will have joints that will pass for first-class.—G. HARDCASTLE.

REPLY TO D. D. S., who asks how to prevent dark joints. When your blocks are ground nearly enough to make a good joint inside and out, wet the approximal sides of the joints with water; then look across them, and you can see whether the joint is true or not. Fit the next block in the same way. Have a good light to work by, and with care you can have good joints inside and out.—A. J. WAID, M.D.S.

QUICK VULCANIZING—ITS DANGER.—Seeing a communication in last month's (May) "Hints and Queries" detailing an experience in quick vulcanizing, prompts me to call attention to the extreme danger of attempting to hasten this process.

I am aware that, when the present small-sized vulcanizers replaced the larger ones previously in use, and that, when it was found that by decreasing the size of the boiler the time required to vulcanize was reduced from one-half to one-third, it was held by some that, from causes not explained,—other than the degree of heat used,—the process of vulcanizing took place much more rapidly in a small chamber, perfectly steam-tight, than in a larger one, or one where from imperfect joints there was a slight escape of steam.

Having been well acquainted with the apparatus and method used in the experiments on which this belief was based, and in correspondence with the parties at the time, and having followed them in their experiments, I became convinced that the time required to vulcanize a piece of work depends *solely* upon the amount of heat that reaches the rubber. There is little or no circulation in the vulcanizer, and under certain conditions it is possible to have the flask and its contents either hotter or cooler than the heat indicated by the thermometer, or the heat indicated by the pressure of a steam-gauge. There is no doubt in my mind that the manner in which the experiments referred to were conducted invited this error.

Of course, the composition of the prepared rubber has very much to do with the time required to vulcanize it. At 320°, the rubber in general use in this country requires within a few minutes of one hour for its proper vulcanization. If the heat is greater, a shorter time is needed to produce the same result; if the heat is less, a longer time; but 10° less *increases* the time far more than 10° more *reduces* it.

The same make of rubber (within a few minutes) always requires the same time, at the same heat.

If it is necessary to reduce the time, as mentioned in the communication referred to, twenty-five minutes to avoid over-vulcanizing, and the piece comes out well vulcanized after twenty-five minutes' exposure with the thermometer indicating 320°, rest assured there is something wrong somewhere, and that the heat in the vulcanizer far exceeds that indicated by the thermometer. The best test of the accuracy of the thermometer the dentist can have is the time it takes to properly vulcanize, and if he regards his safety he will do well to be very suspicious of a thermometer that enables him to vulcanize "Bow-spring" rubber, at 320°, in less than from fifty to sixty minutes.

Over a dozen years ago, the writer devoted considerable time to the study of this subject, and found thermometers liable to defects, and liable to certain injuries, that caused them to act very irregularly, and in a majority of cases when thus imperfect they registered less than the actual heat. We met with a number that seemed to be accurate until near the vulcanizing point, when they began to fail in noting accurately the increasing temperature, falling behind from a few degrees to 30° or 40°, or only rising to a certain point. We examined a number removed because the work done by them was overdone, in which we could find

no visible defect; yet in every case when tested with one known to be accurate, although the mercury rose and fell as the temperature was increased or diminished, their indication was so far from the actual heat as to be a source of danger. In some, on close inspection, the bulb was found checked, a multitude of minute cracks extending over the whole or part of the surface. In some no defect could be detected, and we supposed there might be a little air in the tube above the mercury that checked the rise of the mercury as the heat increased; the slight elasticity of the glass enabling it to do this without fracture. It is very possible for a little air to get in the bulb with the mercury in spite of all precaution; if the amount is small, as long as it remained in the bulb it would do but little harm, but if after a while it found its way into the tube it would cause a very serious error. In choosing thermometers we were led to select those with the mercury extending well into the tube at the normal temperature, as they were found less liable to this error.

The modern arrangement of the mercury-bath, instead of placing the bulb of the thermometer in the steam-chamber, *if the bath is kept full*, saves the thermometer very much, and is equally accurate.

Only a little while since a friend called our attention to the short time he found necessary to fully vulcanize his work. We at once called attention to the thermometer, which he examined, but finding no evidence of injury, continued to use it. A few weeks after his vulcanizer exploded violently. He had set it to run up as usual; he saw it at about 240° , when he left the room for a few minutes, and was on his way back, expecting to find it at about 300° , and remain with it until it reached 320° ; when within a few yards of the door, he was startled by the explosion, and undoubtedly that few yards saved his life. We examined the wreck, and have no doubt the heat was not far from 450° , perhaps more. The bottom was torn out, the fracture showing no signs of any previous defect. The fusible plug remained intact. The fusible plug is a snare and utterly worthless. The only reliable safety-valve we have seen is the thin copper disk introduced a few years ago. In place of that, drill a quarter-inch hole through the cover, and soft-solder a piece of copper as thin as writing-paper over it on the inside. This makes a weak spot with strong margins, and if the pressure becomes too great it gives way, and allows the steam to escape without violence.

We need only bear in mind how much more rapidly steam pressure increases as the temperature increases, and also how rapidly the strength of copper *decreases* when 400° is reached, to be fully alive to not only the danger of working at extremely high pressure, but the greater danger of trusting that part of the apparatus on which our safety depends when we know it is misleading, but do not know how much.

It may sometimes be desirable to save a few minutes in completing a case, but is it wise to do so by running the risk of having our life's work abruptly ended?

It is a safe rule, and will produce far better work, to allow from thirty to forty-five minutes to run the heat from 240° to the vulcanizing point, and make the vulcanizing point the degree of heat, as shown by the thermometer, that makes the work just hard enough, and not too hard, when kept in one hour.—TOBY.

RUBBER-POISONING.—J. D. U. inquires (in the March number of the DENTAL COSMOS) concerning cases of "rubber-poisoning." I would like to say on this question that I have used vulcanite constantly for the past fifteen years, and have worn the material in my own mouth for ten years at least, and I never yet saw anything to justify the belief that a rubber plate, properly vulcanized, could

ever, under any circumstances, poison the mouth or the general system of the person wearing it. To be sure, I have occasionally seen mouths that were red and inflamed in consequence, apparently, of wearing such plates, but I have always attributed this result to the strong suction obtained, and to the heating qualities of the material acting on a tender mouth. I am not ignorant of the fact that numerous cases have been reported in which the use of this substance is supposed to have produced most deplorable results; but experience has taught me that these statements are to be taken with extreme caution. I have learned that these inflamed mouths will often get well without any discontinuance of the plate, and also that the constitutional troubles so often, and it seems to me so recklessly, attributed to this cause may disappear in the same way. About a year ago a gentleman for whom I had made an upper set came to me, weak and emaciated, and suffering apparently from a complication of nervous disorders. His medical attendant had informed him that the plate he was wearing (it was "whale-bone" rubber, I think) was poisoning his blood, and that something must be substituted for it. I frankly told him I would make the change if he desired it, but that, in my opinion, the plate had nothing whatever to do with his trouble, and gave my reasons for so believing. The result was that he continued to wear the set, and the last time I saw him his health was greatly improved, and he was heavier than ever before in his life. The arguments of the "poison" theorists seem to amount simply to this: mercury is a poisonous substance; red rubber contains mercury; therefore red rubber must be poisonous! For my own part, I have always maintained that the mercury contained in this material is so thoroughly combined and incorporated with the other ingredients that it is impossible to extract it without destroying the integrity of the plate itself. This is the common-sense view of the case, and it is a view that has been sustained whenever the matter has been tested by scientific methods. In fact, this point seems to be conceded even by those who appear to regard it as especially "high-toned" to decry the use of vulcanite. I notice that a recent medical writer (see "Periscope," in *DENTAL COSMOS* for February) is obliged to resort to the theory of "softening" and "gradual disintegration" of the rubber in order to make out a case against it. There is not a dentist of ordinary sense and experience in the country who does not know that no such softening and disintegration ever take place in vulcanite plates as generally made and worn. This writer shows an ignorance of the whole matter which might have prevented a more modest man from writing about it at all. He speaks of the "fact that at least one-third of those who attempt to wear them experience great irritation of the mouth," etc. If there is any such "fact" as that, I am totally unaware of it. I seldom have any complaint except from the chafing of some part of the plate, which is, of course, easily remedied.

On the whole, I think J. D. U. will be more likely to find some satisfactory solution of his difficulty outside of the theory of "rubber-poisoning."—C. E. M.

A MAGIC TOOTH-POWDER.—The following formula for a tooth-powder is going the rounds of the medical journals. Its special recommendation seems to be that, being a white powder, it turns red when moistened. Its manifest unfitness as a dentifrice does not appear to have been considered.

"A white tooth-powder, which turns red when moistened, is made by reducing to a fine powder cochineal, 15 grains, and alum, $\frac{1}{2}$ drachm, and mixing with powdered orris-root, 1 ounce; cream of tartar, 10 drachms; carbonate of magnesium, $1\frac{1}{4}$ drachms; powdered cuttle-fish bone, 5 drachms; and oil of rose, 5 drops."—H.

THE
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No. 7

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to Act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the office of the Librarian of Congress at Washington.]

(Continued from page 287.)

THE *syrup of lactucarium*, when well made,—and I have found remarkable difference in this regard,—is also a delightfully calming, soothing medicament, one which induces a condition of quiet that permits rest and allays irritation, both physical and mental.

This, like the solution of the bi-meconate of morphia, may not produce sleep, and indeed the wakeful state of quiet is rather the more likely to ensue, but it is very acceptable, and with some patients preferable to somnolency, especially during the evening and earlier hours of the night.

The dose of syrup of lactucarium is from a teaspoonful for a child to a dessert or even tablespoonful for an adult, repeated in an hour or two if required.

Hydrate of chloral.—This valuable medicine is always given in solution; a convenient formula is

R.—Hydrate of chloral, ℥ss;
Orange-flower water, f℥i;
Simple syrup, f℥ss.
S.—Tablespoonful as a dose;

repeated, if necessary, at intervals of two or three hours for two or three doses.

Bromide of potassium.—Although my experience with this preparation has not been such as to lead me to accept it with the enthusiasm somewhat extendedly evinced for it, I have nevertheless occasionally

found it a very effectual remedy; the favorable results have usually been produced in cases where patients have tried it before and have been pleased with its effects; therefore, if upon inquiry I find this to have occurred, I prescribe it. The dose is from twenty to sixty grains (single dose), and it may be conveniently given either in sweetened water, syrup, or milk.

Like opiates, there are idiosyncratic cases (rare) in which this medicine is inadmissible, producing general uneasiness, nausea, and finally decided sickness and headache, which is only relieved by vomiting.

A combination of bromide of potassium, hydrate of chloral, hyoscyamus, cannabis indica, and aromatics, to which is given the name of "Bromidia," I have found to be, as is claimed for it, an excellent hypnotic. Every fluidrachm contains fifteen grains each of bromide of potassium and hydrate of chloral, and one-eighth grain each of extract hyoscyamus and cannabis indica. To some patients the taste of this compound is not objectionable, but to others it is excessively so. I ordinarily administer it in doses of from half a fluidrachm to a drachm, as the pain is less or more severe, either in water or in syrup; and, if it is disagreeable, I have had almost universal success in overcoming this difficulty by adding to it an equal amount of a syrupy solution of pulverized extract of licorice root (extract. Glycyrrhizæ pulv.). This not only renders the taste less objectionable, but seems to make it more easily tolerated by the stomach.

As a connecting link between opiates and sedatives, I would mention the old stand-by known as *Dover's Powder*. This combination of ipecac, opium, and sulphate of potassium is an excellent anodyne diaphoretic, and is particularly indicated in cases of periodontitis in which there is high fever, headache, or nausea.

In ten grains of *Dover's powder* (pulvis Ipecacuanhæ compositus) there is one grain of opium; this is therefore an average dose; it is given in water, syrup, or molasses, and may be repeated, if required, at intervals of six or eight hours. It is, however, seldom that more than one dose is indicated, as the adjunctives meanwhile usually sufficiently control the suffering.

4th, *Sedation*.—Besides the foregoing means for relief we have, as powerful adjuncts, a number of *sedatives*.

The first of these is *tartar emetic* (tartrate of antimony and potassium—Antimonii et Potassæ tartras. This should be given in doses of from half a grain to a grain every two or three hours for a day or two, diminishing the frequency of the giving if indicated, the object being the induction of slight nausea *without emesis*.

The administration of this medicine should not be continued for

more than the "day or two" directed, as the *cumulative* effects are sometimes exceedingly depressant.

Tartar emetic is also, most decidedly, an idiosyncratic medicament, and it should be known that, though rare, there are cases in which the smallest appreciable dose is capable of inducing distressing and long-continued depression.

Tincture of American hellebore (*Veratrum viride*).—This powerful tincture has been very appropriately styled the "numerical medicine," as it usually controls the frequency of pulsation with mathematical accuracy.

In periodontitis the frequent, full, and strong pulse is that which gives the most continuous and most violent pain. Its strength is modified by the use of local depletives and sedatives; its fullness is diminished by the use of derivants; and its frequency can be controlled, probably, more accurately by the tincture of *Veratrum viride* than by any other medicament: given in from *one-* to *five-drop* doses, according to age of patient, every three hours, it soon slows the pulse to normal frequency, and this may be maintained by giving one drop of the tincture every three hours.

Tincture of aconite root (*tinctura Aconiti radiceis*).—(I desire particularly to be understood as referring now to the tincture of the Dispensatory, and *not* to the *dental* tincture of aconite.) I do not wish to speak too strongly of this medicine, lest some may be disappointed in the results which they would thus be led to expect, but my experience is, that the tincture of aconite root can be relied upon as *the* antiphlogistic. I usually prescribe from *two* to *three* drops in water, twice or thrice daily, diminishing the quantity and frequency of dose as rapidly as possible. I give this as the *usual* and *prudent* practice, but some of my very best results have been in cases where I had to largely exceed it. In some instances of violently uncontrollable suffering I have pushed both local and general use of this medicine until tingling of the lips, nausea, and even extended numbness and decided weakness and slowness of pulse were produced; and it has been in some such instances, that both patients and I have been most satisfied with the success which crowned our efforts, where the attainment of relief seemed utterly hopeless.

I would not, by any means, suggest such practice unless the exigencies of the case fully warranted it; neither would I recommend the tincture of aconite root as I do were it only eminently useful when used heroically; but it is so markedly beneficial in exercising the desired curative influence even when used in minimum doses, that I cannot do other than give it merited notice.

It will sometimes happen that excessive systemic irritability will supervene as the result of severe periodontitis. This is announced by

the peculiar, sharply-defined *facial expression* of excitement, the petulant tone, the unbalanced assertions of inability for further endurance, and expressions of dissatisfaction for which there is no reasonable cause. When such condition is pronounced, great relief will usually be promptly afforded either by the administration of assafœtida,—two-grain sugar-coated pills, of which two, three, or four may be given during the twenty-four hours,—or by the use of the valerianate of ammonium; this is also best given in form of pill, sugar-coated,—one or two two-grain pills at intervals of four to six hours. An excellent soothing compound is the following:

R.—Bromide of potassium, ʒij;
Compound spirit of ether (Hoffmann's anodyne), fʒi;
Camphor water, fʒij.

S.—Tablespoonful every two hours until relieved.

If, as the result of accurate, energetic, and persistent treatment, a resolution of this "third-grade" periodontitis has been attained, it then behooves the practitioner to proceed with exceeding caution in the preparation of the tooth for final stopping.

If, during the progress of treatment, the opening into the tooth has been confined to the cavity of decay or a cavity from which a filling has been removed, I deem it a matter of the first importance that such arrangements shall be made as will positively preclude the necessity of any future removal of the reinserted filling, or of any future entrance at that point, unless it be *through the filling* by means of an orifice especially prepared for the purpose of giving relief should it ever be needed.

If a tap-opening has been made at a *convenient* but *not appropriate* place for thorough and direct entrance into the canal or canals, such entrance should for the time be ignored, and the appropriate point having been determined (see DENTAL COSMOS, October and November, 1877), a proper tap-hole should be drilled.

As has already been suggested, all operations upon cases of this grade of inflammation should be characterized by especial gentleness, especial consideration as to length of duration of manipulation, and especially excellent quality and *condition* of instruments.

The proper entrance having been effected, should there be *any soreness*, or *even knowledge of the presence of the tooth*, nothing more should be done than the gentle stopping of the *new orifice* with a pellet of cotton slightly moistened with sandarac varnish (alcohol, ʒi; oil of cinnamon, ʒi; oil of cloves, ʒi; gum sandarac sufficient to make varnish). It would also be safer if the gum were painted with dental tincture of aconite, and *positive* directions should be given in regard to *immediate* visit in the event of even the *slightest* recurrence of untoward symptoms.

Should there be no soreness whatever resulting from the preparatory drilling and burring of the "proper" entrance, a thorough cleansing of the pulp-cavity and canals may be indulged in; this should be done by first loosening any remaining *débris*, either food, inspissated contents, or remains of pulp *which are easily accessible*, and then washing the cavity by syringing with tepid water.

The moisture should then be absorbed by bibulous paper or absorbent cotton, after which glycerin should be introduced from the end of a medium-sized probe; the pulp-cavity and cavity of entrance being full of glycerin, this should be gently, but as thoroughly as permissible, worked into the canals by fine probes.

In such canals as will admit *easily* of a fine, hooked probe, this will be found superior to a straight, smooth probe, as it both breaks up and, to a considerable degree, removes the putrescent pulp-tissue, while the introduction of the glycerin is deodorizing and purifying.

I think it prudent to repeat here the caution I have already given in relation to hooked and barbed instruments; with such, made of the best material, and in the best form (round), tempered with the utmost care and manipulated by an expert, there is possibly little danger of breaking off the end, even in a comparatively inaccessible canal; but with the ordinary "nerve-hooks," or with the more readily-broken, square-taper, barbed broaches, it becomes a matter of much difficulty to escape the constant danger of breakage which is inseparable with anything approaching *thorough* cleansing of canals.

During the "working in" of the glycerin this naturally becomes quite turbid, and sometimes even very darkly discolored; it should then be washed out by repeated syringing, the mouth emptied, the pulp-cavity and canals reasonably dried, and the glycerin application repeated. After this has been done it is proper that the cavity and canals should be washed with alcohol; this is done by passing the medicament from a blunt probe, working it into the canals by fine probes, and then finally cleansing them by taper-twists of cotton wool.

It is at this stage of the operations that the filling of the cavity of decay (if it be required) or the filling of the "relief drill-hole" (if one has been made) is in order.

I have already, when upon the filling of "tap-holes," spoken of the advantage of plastic fillings in such, but it is in the cavities of teeth which are liable to "third-grade" periodontitis that the comfort-giving possibilities of these materials are eminently apparent.

The fact of the *great liability* of provoking a recurrence of peridental irritation as the result of such pressure as is essential to the production of a good foil filling, and the *imminent danger* which would be acknowledged by the vast majority of practitioners to exist in

the event of long-continued malleting, is a thing well worthy the most thoughtful consideration.

It was the evident danger to pulps which resulted from the removal of *contiguous decay* that *compelled* attention to the theories advanced by Prof. Arthur; it was the *success* which attended the modified practice he advocated which promptly *demand*ed its teaching from the advanced lecturers; it is the evident danger from foil fillings to teeth whose surroundings are of this highly inflammatory tendency that has directed attention toward the *scientific* use of the various "plastics" in this connection; and the *success* which has been *demonstrated* as possible with them is already *demand*ing their teaching from the advanced lecturers.

Each year will now give dental students increased facilities for acquiring knowledge in regard to these, and each year will therefore show increased proportion of comfort and satisfaction in the final management of these difficult cases.

The filling of the cavity of decay or relief drill-hole having been decided upon, it is first necessary to insure that no interference with the tap-entrance into the canals shall result from this operation.

To preclude this, a cotton pellet may be inserted into the pulp-cavity, and effectually compressed by another pellet in the tap-hole, *if the opening between the "entrance" and the cavity of decay be small or only moderate in size*; but it often happens that the opening into the pulp-cavity from the cavity of decay is large, and sufficiently so to permit of decided bulging of the cotton into the cavity of decay; in some such cases of very large cavities, the cotton may be moistened with varnish, and then be so compressed as not to interfere with the filling; but, if large, open connection exists between the pulp-cavity and the cavity of decay, it is far better as a rule to introduce small pellets of cotton into the mouths of the canals, and then place *carefully* (that air be not pressed before it) a *temporary* filling of gutta-percha in the pulp-cavity, and sufficiently into the tap-hole to shut off communication with the cavity of decay; should any excess of gutta-percha be forced into the cavity of decay, it can then be neatly trimmed away with warm instruments or with burs.

After the filling of the cavity of decay the temporary filling of gutta-percha and the pellets of cotton should be removed.

The canals should then be filled with glycerin, a small pellet of cotton moistened with oil of cloves should be placed *gently* into the pulp-cavity (no cotton in the canals), and a dry pellet of cotton placed loosely in the tap-hole.

It is well to paint the gum with *dental aconite* as a prophylactic; direct the patient not to eat upon the tooth (which is now comfortable, and which might be incautiously bitten upon), and to gently

remove the cotton if the tooth should, unfortunately, become sore at such time as it would be impossible to make a visit to the dentist for relief.

All this in these grave cases should be done *preferably* in the beginning of the week, that four or five days may be made available for contingencies, prior to the unavoidable interference with consecutive treatment which might accrue as the result of trouble arising on Sunday.

If in two or three days no soreness supervenes, a fresh dressing, quite like the first, is indicated, with *perhaps* the gradation of a slight increase of tightness, or rather a *decrease of looseness*, I would prefer to say, so critical is this manipulation at this juncture in these cases.

(To be continued.)

ESTHETIC DENTAL PROSTHESIS.

BY W. WARRINGTON EVANS, D.D.S., M.D., WASHINGTON, D. C.

WE often hear at dental conventions and in local societies very disparaging remarks with regard to the present status of prosthetic dentistry,—“mechanical dentistry,” as it is termed. Generally, when this subject is called for discussion, some one will declaim about the decline of mechanical dentistry, will contrast unfavorably the work done in this department now with that of twenty years ago, and will place the blame of the inferiority upon the heads of manufacturers. Another, while claiming that this branch of dentistry ought to be elevated, prefers to let his brethren do it, evidently not wishing to lower his dignity in the undertaking; then again another thinks that probably there is an advantage in this lowered quality of mechanical work, because, seeing such miserable work in their unfortunate friends’ mouths, people will be induced to take better care of their own teeth, and thus obviate the necessity of wearing artificial teeth. Certainly a very pretty idea, that the millennium of sound teeth is to be reached through laboratorial botch-work. As a matter of fact, however, teeth will decay, and their possessors frequently will not have them attended to until the use of the forceps becomes necessary. The demand for artificial teeth exists, always will exist, and should be met intelligently, artistically.

It is my intention in this communication to illustrate by specimen work some points in prosthetic dentistry only vaguely hinted at in text-books, briefly referred to in lecture-rooms and dental journals, but overlooked by many dentists, and carried out in practice by but an appreciative few.

I have tried at conventions to establish the claims of this neglected

branch of dentistry, but without material success. The subject is usually put off until too late in the sessions to discuss it, or, if taken up at all, it is treated in a perfunctory manner. One would be led to suppose the subject unworthy of discussion. Many practitioners have students or employés to do their mechanical work, or they engage young practitioners at small fees to work on their (imperfect) impressions or models; these never see the patient, and hence have no other guide than that afforded by the models. The principals do not hesitate to accept pay for the work, however unsatisfactory it may prove to the patient.

The reasons given by many dentists for not doing work according to what their artistic sense may prompt are: first, that there is not obtainable a sufficient variety of characteristic teeth; and secondly, that their patients cannot appreciate, and consequently will not pay for artistic work.

In answer to the first objection, I must say that we have some of our brethren with imposing professional reputations to blame for the "picket-fence" style of artificial teeth, and the profession generally have, to say the least, been indifferent. The manufacturers for a time produced teeth in deference to the instructions of their patrons, usually based on careless and limited observation. But, finding no uniformity in such teachings, enterprising manufacturers have studied up the requirements for themselves, with the result of the production of a much better style of teeth than formerly.

I have made it a point to visit and carefully examine the stock in most of our large manufactories of dental goods, and have found an admirable variety of teeth, especially plain teeth used for continuous gum or celluloid work; yet, strange to say, those teeth most beautiful in contour and coloring have the least sale, owing to the demand for certain stereotyped forms of the "split-bean" type.

Let dentists be educated to appreciate what the natural shape of a tooth is, and thus create a healthy demand which the manufacturers will be glad to supply. Probably ninety-nine out of a hundred dentists cannot carve a tooth without a pattern, not even a central, out of ivory or other suitable substance, that will be a close imitation of nature. How can we become true prosthetists so long as we are deficient in such fundamental knowledge? Certainly we should not censure the manufacturers when we ourselves are to blame.

There are those who, having a knowledge, natural or acquired, of the nicer points in prosthetics, feel that an exercise of taste is not appreciated or paid for. Then there are those who give the subject no thought, but "get up" artificial dentures in a certain routine manner in which all discriminative deviation seems to be scrupulously avoided, dispatch and quick returns being the chief considerations.

A third class have never had their attention directed either by artistic instinct or by their preceptors to the subtler requirements of true prosthesis. The first class are depriving the art which they practice of much that they might do for its advancement. Let them show to their patients by practical examples the difference between the mere mechanical and the artistic, and most patients will cheerfully pay for the extra work required. As for the second class, nothing further need be said. The third class are not to be censured for their shortcomings as much as are their preceptors and the colleges. True, a college never can make a dentist of a man, yet here it is that the young man makes the beginning of his professional career. Would it not be better, for instance, that more time should be devoted to a thorough consideration of the expression of teeth and their modifications than to employ so much of a short course on general metallurgy, the processes of refining gold, etc.? These subjects are well enough, but they can be learned by the students from the text-books, while the art of prosthesis, to be taught profitably, must be demonstrated by example, and should be illustrated by specimen work of the most varied, comprehensive character. The student should be compelled to appreciate that when he makes artificial dentures he restores a factor in that kaleidoscope of expression, the human face; he should be made to comprehend that *artificiality* is as much to be avoided in a denture as inefficiency. The restoration of expression is, all things considered, of at least equal importance to the restoration of function, and failure in the former is as dishonoring to the practitioner as in the latter, and certainly more damaging to his reputation. In the one case the wearer alone is the sufferer, while in the other a discomfort is experienced by every observer of the esthetic blunder.

We claim, therefore, that a recognition of the artistic requirements of every individual case is an absolute necessity to the dentist; he need not fear that he will bring to his practice talent for the exercise of which there will not be offered abundant opportunity, followed by a reward in professional status and pecuniary remuneration. It will not do to say that the range of selection of artificial teeth is not adequate. It is, indeed, far wider than most of us have the taste or skill to make use of. I wish here to particularize one class of teeth,—the plain; these permit the display of the highest art in the differing effects upon expression which may be produced. All the various and charming effects produced by manufacturers in sectional teeth can be more than equaled by a judicious management of single teeth, avoiding, at the same time, the glaring defects of the blocks. A partially-erupted tooth, an overlapping or twisted tooth, a vacant space as though the result of extraction, a tooth showing a neat gold filling, incisors worn as though by long attrition, variations in curvature of

the arch, more or less recession of the gums, differences in the slant or pitch of the teeth, slight and characteristic malpositions, pointed cusps, rounded or square-cut edges, adaptations to sex, age, temperament, etc.,—afford a large field for the exercise of taste and the reproduction of individual dental peculiarities.

We have the materials, then, to work with, as any one may readily satisfy himself by examining the stock in the larger depots. Now it remains with our preceptors and colleges to put into the hands of students the fruits of their ripe experience. Let the colleges select the most capable men as demonstrators of prosthetic dentistry, and pay them as high salaries as are given to the professors of this branch, if not higher. The position of a demonstrator is a much more responsible one than would at first thought be supposed. He should put into tangible practical work the teachings of the lecture-room. The student should never be hurried; he should have ample time to attend to his college practice properly; the work at colleges should be done, not so much to show how expeditiously patients may be accommodated who must leave the city by the next morning's train, as for the practical improvement of the student. The demonstrator has in a great measure in his hands the shaping of the student's future course; he should represent the true, refined advancement of the profession rather than his individual practice. The student, then, going forth with an intelligent idea of the capabilities of the profession, would soon educate the public to discriminate between the work of the artist and that of the charlatan, between the mere theorist and the practical worker.

I do not say these things in the spirit of ill-natured criticism; far from it. I cherish the highest regard for the colleges; they do a good work. I only point out where an improvement might be made.

It is not the intention of the writer to do more at present than to call attention to a few illustrations of what may be accomplished by the judicious use of single teeth in the production of varying and characteristic dentures.

Our illustrations will be of practical models taken from characteristic mouths. Fig. 1 represents two sets of six front teeth from the same mould,—one as it leaves the mould and is found in stock; the other showing alterations by grinding to suit a different case. Figs. 2 and 5 represent two sets of mounted teeth, both from the same mould (shown in Fig. 1). Fig. 2 represents a younger mouth than is often found requiring a full set of artificial teeth; but, in order to show the different characteristics of youth and age which may be produced from the same set of teeth, I adopted for my model the denture of a young German lady-patient of about eighteen years of age, reproducing the slight irregularities existing in her case. The

artificial teeth illustrated in Fig. 1 were so well adapted to the case that very little modification by grinding was necessary, even the

FIG. 1.



cusps of the bicusps and molars scarcely requiring to be touched by the corundum wheel (see side view, Fig. 3), thus enabling me to

FIG. 2.

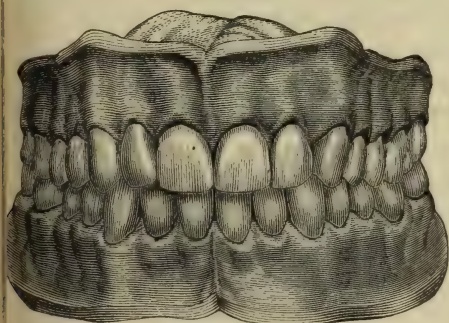
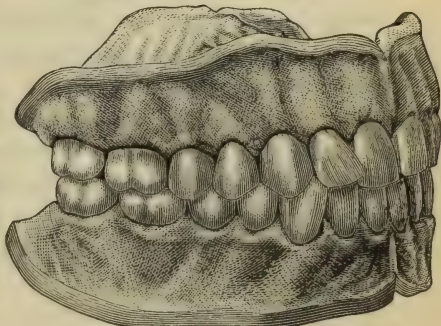


FIG. 3.



preserve the original form of the artificial teeth almost intact. The cutting edges have that beautiful rounded appearance so generally found in harmony with the general physique at this age, the serrations found at an earlier period having all disappeared. Fig. 4 shows a palatal view of the same case, and certainly indicates that a vast improvement has been made of the grinding surfaces by the manufacturer. The cusps and intervening sulci are clear and well formed, requiring in any case but little labor on the part of the dentist to make a most perfect occlusion. We will not discuss the palatal and dental arches of

FIG. 4.



this case, as we shall have more distinctive ones further on. Fig. 5 shows the front view of a set of teeth for a male fifty or sixty years

FIG. 5.

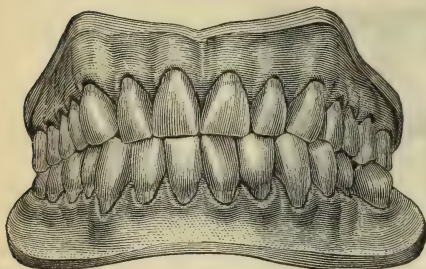
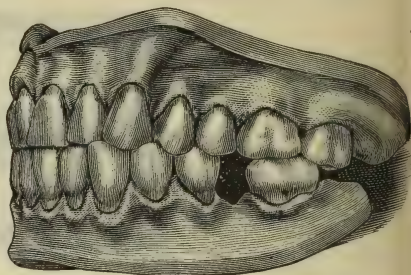
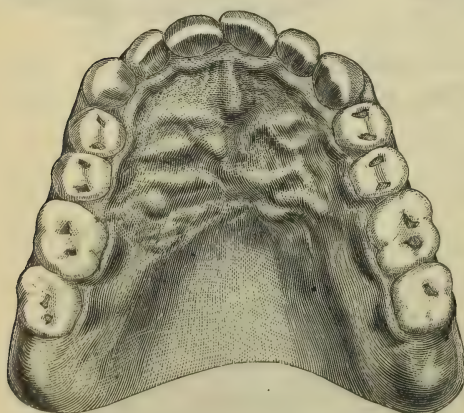


FIG. 6.



of age. It is somewhat of the Celtic order, though not what would be considered a pure type. We have in this case a "square bite" upon the cutting-edges, producing slight abrasion, and with just enough irregularity to produce a pleasing effect. The gums show slight recession from the necks of the superior teeth, more marked in the inferior incisors and cuspids, and accompanied in the latter with a congestion of the gums, making the festoons more prominent than normal. The prominence over the superior canines will strike some as being too great, but, considering the inclination of the roots and the contraction of the arch back of the canines, it is not too marked, which is more clearly shown in Fig. 6, a side view of the same case.

FIG. 7.



In the lower maxillary the sixth-year molar is missing, and the twelfth-year molar has moved forward just enough to adjust itself to a solid occlusion, the absorption of the alveolar process causing a greater recession of the gums at the necks of the second bicuspid and molar than elsewhere. The abrasion of the cutting-edges is best shown in Fig. 7, a palatal view of the same case, more marked

upon the incisors and cuspids than upon the bicuspids and molars, owing to a perfect lock occlusion, as shown in Figs. 5 and 6. The cutting-edges of the front teeth have been stained to imitate the effect of tobacco upon denuded dentine. The rugæ in the cut show a direct transfer from the model upon which the case was mounted.

(To be continued.)

THE ELECTRO-MAGNETIC MALLET.

BY GEORGE B. McDONALD, D.D.S., CONNEAUTVILLE, PA.

(Abstract of a paper read before the Penna. State Dental Society, July 31, 1879.)

THE electro-magnetic mallet had its conception in the inventive brain of Dr. W. G. A. Bonwill, in February, 1867. Within one year he completed his first mallet and used it instead of a hand or automatic mallet for the purpose of impacting gold into cavities in the teeth. Several of these mallets were made for and were operated by a number of dentists, among whom were Drs. Louis Jack and Marshall H. Webb. Dr. Jack made a modification of the mallet which he and several others used for a time instead of Dr. Bonwill's. Soon after Dr. Webb reduced the size of the instrument and made some important changes, particularly in the adjustment of the parts of the Bonwill mallet, which he was then successfully using. While Dr. Webb insists that Dr. Bonwill invented the first practical electro-magnetic mallet, and that the credit belongs chiefly to him, yet so fine are the adjustments and important the changes made by Dr. Webb, that the instrument ought to at least be known as the Bonwill electro-magnetic mallet, modified and improved by Marshall H. Webb. In July, 1875, Dr. Webb first used the instrument as modified by him to build up a gold crown. It is of this improved mallet that I propose to speak at this time, as an invaluable aid in the operation of substituting gold for lost tooth-structure, thereby restoring diseased and almost useless organs to a condition of usefulness and comfort. Since 1875 Dr. Webb has operated and many have adopted and used this instrument with complete success, to the exclusion of all other mallets, for the purpose of restoring lost tooth-structure with solid gold, and a few use it for the insertion of porcelain fronts or crowns faced with porcelain where both crown and root are gone, thereby relieving many persons from the annoyance and inconvenience of wearing a plate. This proves most conclusively that the electro-magnetic mallet is not a failure in the hands of those who have learned to properly use it. I do not claim that all the operations performed by the use of the electro-magnetic mallet are successful, for that is not the case. Experience teaches us that some operations fail in a comparatively short time, even when the best material is used, the best skill employed, and with the help of the most perfect instruments known to the profession. But while using the electro-magnetic mallet with the greatest comfort and ease to my patients as well as to myself, in an extensive practice, I hear of others with whom it is a failure. In the hands of many operators the electro-magnetic mallet is a practical success. Why this con-

flicting testimony? One says the battery is expensive to keep up, and that it is unreliable. Another says the mallet is intricate, difficult of adjustment, and always out of order. A third says the blow of the mallet fractures the margins of cavities while impacting gold with it. Still another says he cannot fill half so fast with it as he can with hand-pressure instruments or with the hand mallet, the automatic, or the engine plugger,—the fault always in the mallet, never with the operator. All of these objections are, from my point of view, without foundation except the last. It is true that it usually takes a longer time to perform an operation with the electro-magnetic mallet than with the aforesaid instruments,—that is, if one uses gold in the proper form, namely, one sheet, of No. 4 or 5 folded to No. 16 or No. 32; cutting it into strips from one-sixteenth to one-eighth of an inch in width, and packing each piece into the cavity uniformly solid before adding another. Of course gold can be speedily stuffed into a cavity by the use of hand instruments, the gold being prepared in the shape of pellets, cylinders, or of ropes twisted with the fingers, but this should never be done. I am glad that the electro-magnetic mallet necessitates a different method of preparing and packing gold, resulting in a more uniform and perfect solidity. In filling teeth not only skill, judgment, and ingenuity are required to perform operations properly, but *time*. There are now say fourteen thousand dentists in the United States, all of whom are engaged to some extent in filling the teeth according to different methods and with different instruments. Though each of these, we assume, designs to save the teeth intrusted to his care, yet many fillings fail in a short time. Much of this is due first to a want of knowledge how to fill teeth properly, and secondly to not giving more time to the details of the operation. Often more teeth are filled for a patient in one day, and at one sitting, with hand-pluggers or with hand or automatic mallets, than could be properly filled in two weeks. I am satisfied that one hundred thousand dentists could not *properly* perform the necessary operations upon the teeth the cavities in which the fourteen thousand attempt to fill.

The points of superiority which the mallet I have been referring to has over all other instruments I have ever used for the restoration of lost tooth-structure can be summed up as follows: More perfect operations can be performed, and with greater ease and comfort to both patient and operator. Less time and effort are required to perfectly adapt the foil to the walls of a cavity and to make the gold of uniform solidity than by any known method. The operator is enabled to stand square on both feet, and, holding the mallet like a pen or pencil, can with a slight motion of the index finger close the circuit and thus set the instrument in operation. I will here refer to my

own experience in filling and having teeth filled. I had my teeth filled with soft gold thirty years ago, hand-pluggers being used to pack the gold. I began filling teeth with soft gold twenty-six years ago, using hand-pluggers to pack it with. From that time until this I have used most of the instruments, materials, and appliances that have been made. About fifteen years ago I adopted the use of the hand-mallet and cohesive gold. Since that time I have used three automatic mallets and one engine mallet. I used the last-named instrument four years, and considered it at that time an improvement. During the time I was using these mallets I had them frequently employed on my own teeth, so that I am enabled to speak from the patient's point of view, as well as from that of the operator. For four years I have been watching the operation of the electro-magnetic mallet, in the hands of Dr. Webb, but for a long time declined to get one, on the ground that the Buckingham mallet was good enough for me. Never have I been more deluded. About two and a half years ago Dr. Webb filled a tooth for me with the aid of the electro-magnetic mallet, and since that time he has restored several of my teeth with this mallet from an abraded and broken-down condition to their original form and usefulness. About two years ago I adopted the electro-magnetic mallet to which I have referred, and have used it to fill every tooth in which I have placed gold from that day to this, and shall do so all my life, or until some better instrument shall be invented, and I do not mean ever to have another tooth filled by any other instrument. The blow of this mallet is much more agreeable to me than that of any other instrument that has ever been used on my teeth, and this is the universal verdict of my patients who have had other mallets used on their teeth prior to the electro-magnetic mallet. When operating with this instrument for patients who have never had a mallet used in their mouths and who think the blow severe, I at once give them a trial of an automatic or hand mallet, and I have yet to find the first patient who is not only willing but anxious to have me return to the use of the electro-magnetic. Gentlemen who say this mallet is a failure, and who talk about the profession soon going back to soft gold and hand-pluggers, have failed to properly understand and use the mallet. When we shall exchange our palatial ocean steamers for our forefathers' "dug-outs," when we shall exchange the lightning express train for the primitive stage-coach, when we shall exchange the telegraph for the carrier, then will we give up the electro-magnetic mallet and cohesive gold for hand-pressure instruments and soft gold. If you pronounce the electro-magnetic mallet a failure, I ask, Have you used it? If so, and you failed, the failure was in you and not in the mallet; you failed to properly understand it. If you have not

tried it, you still made a failure in taking any man's assertion that it is not a success without trying it faithfully for yourself. Instead of saying, "Prove all things, and hold fast to that which is good," I would say, "Hold fast to that which is BEST." If you have failed to use it satisfactorily, before laying the instrument aside get some one who understands the mallet to show you what the trouble is, how to adjust the parts and run the battery, and you will soon learn how to operate it successfully. Gentlemen, you cannot afford to do without this mallet, and your patients cannot afford to go without the perfect operations it will enable you to perform.

CLINICAL REPORTS.

PHILADELPHIA DENTAL COLLEGE—DEPARTMENT OF ORAL SURGERY.

SERVICE OF PROF. J. E. GARRETSON.

THE clinic to-day, gentlemen, has its lesson from a stand-point in operative oral surgery. The gentleman lying upon the table in an unconsciousness begotten of sulphuric ether is a private patient, an actor of wide reputation; to name him would be to make most of you feel that an acquaintance was before you. The operation is done here to spare ourselves and the patient inconveniences sure to be encountered at his hotel. When the resection to be made is accomplished, and shock has been recovered from, he will be taken to his rooms in a carriage.

You were not admitted to-day as usual. You met the anæsthetic condition on entrance. You will be good enough to accept the hint as to quietude. I will ask you to go out after the completion of the operation, not waiting until the gentleman is allowed to recover consciousness. I desire particularly to avoid in the case all unnecessary excitement.

The anæsthesia controlling the patient is, as you see, complete. It is exclusively ether-anæsthesia. We will use to-day no chloroform. Watch the progress of the administration of the agent as Dr. Dorr exhibits it. To use successfully an anæsthetic while conducting a prolonged surgical operation within the mouth demands an experience not always easily come by. Do not lose through inattention the opportunities to get rich experience offered by this clinical service. Make full notes in your books and memories of all you see done in cases like the present one. In the future you will find plenty of use for such reminders.

The gentleman has a tumor of the lower jaw. In its treatment I

shall have to make a section extending from the lateral incisor to the ramus. More than this, it will be necessary to remove the inner face of the cheek full half the thickness of the parts. What else we may be called on to do will be exposed to us as the operation goes on.

What is the nature of the tumor? When I tell you that it is not to be put in the class we designate as *self-explainable* you will know the growth as a neoplasm. What kind of a neoplasm? Carcinoma without a doubt. The particular histological variety is to be learned alone by microscopical examination. Venturing an opinion, I would class it with the order sarcomata.

Calling the disease carcinoma, you know all about it; that is, you know all about it in knowing nothing about it. That remark has in it no paradox to this class. Nobody can tell us anything about cancer, because, clinically speaking, we know all about it in knowing what it is not. I have great pride, gentlemen, in giving to you my classification of tumors. I believe I have made you thoroughly appreciate that classification. Rest assured, that in the diagnosis by exclusion we practice, it is next to impossible to be deceived by a cancerous growth. The case before us is cancer for the reason that it is not something else; about the Else we know everything. To be able positively to assert that this tumor belongs in no way to that Else is to be able to declare certainly that it is that which the Else is not. This must be accepted as logic. Experience will verify it as fact.

We come to the operation. What more important to an actor than the avoidance of scar? The face, however, in the present case must be opened. The jaw must be exposed from symphysis to ramus. How are we to harmonize requirements so antagonistic? Ugliness in the human face lies in absence of symmetry. We are to consider symmetry. I enter this pointed and curved bistoury in the center line of the lip, midway between its free border and base. Inclining the blade at an angle of about forty-five degrees, I cut out at the free border. As you see, the lip is just half divided, and two streams of blood are jetting *per saltum* from a particular spot on either face of the wound. These streams come from the coronary branches of the facial arteries. We stop, and my friend Dr. Packard, whom you all know as the author of the work, bearing his name, on operative surgery, kindly picks up the vessels while Dr. Wolford, the gentleman at my right,—the patient's physician,—ligates them. I also have the assistance of Dr. Benham.

The bleeding controlled, the patient will have given to him a little more ether. Re-applying the knife, now changed for a scalpel, the incision is carried with the same obliquity below the mental prominence. Now comes a long cut. We are to open the neck from the symphysis menti to the maxillary ramus. How is this to be done without great

risk to important underlying vessels? It is an easy matter. I mark the line of proposed cut with a lead-pencil, and by so simple an action as flexing the head a trifle find myself able to draw up the line until it rests directly over the jaw. This manipulation obviates all danger. Bear on hard as I please, I can cut no deeper than the bone: a little matter, but of great importance; do not forget it.

Here a large vessel is spurting its blood into our faces; we have cut, necessarily, the facial artery where it passes over the notch in front of the masseter muscle. We stop again a moment and use the ligature; we also use more ether.

. . . The lip and lower portion of the cheek dissected away, the tumor is now brought into full view. Everting the cheek, attention is also directed to the extension of the disease into this structure.

No occasion now, gentlemen, for hurry; you can take your time in examining the ugly and threatening growth. Here is pathology, pure and uncomplicated; make intimate acquaintance with it.

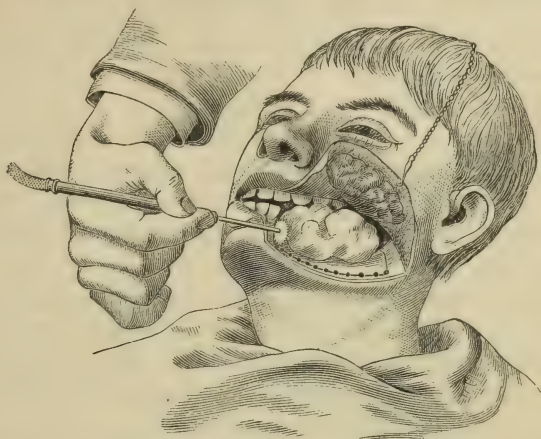
Before touching the cheek we will take away the diseased bone. I feel for healthy structure by using a spear-drill. . . . This first touch is bad, very bad; the drill falls into a carious mass. . . . This second exploration is better; the bone is harder. . . . I try again; solidity increases. The rim of bone about which I so frequently speak to you can be retained in this operation. In this rim of bone lies, as you understand, the difference between symmetry and deformity. If our patient is cured of his carcinoma, he will pay for the good no cost by way of disfigurement. That at least we will spare him.

Proceeding to the operation, I practice before you a manipulation which happily anticipates the possibility of the saw's catching. Using this same spear-drill, I make a series of punctures along the track of the proposed cut. . . . See with what ease and rapidity this is done. . . . Now the revolving saw. . . . It is running about two thousand revolutions to the minute. The faster it runs the better. . . . You will have to say that it has made the resection neatly. Here in my hand are tumor and bone, and here in the patient's mouth is a delicate arch keeping apart, and holding firmly in place, the two portions of the jaw from which our section has been taken. So wonderful and reliable a power in oral surgery is this White's surgical engine that, having become accustomed to its use, I do not think I would be able to get along without it. It has revolutionized mouth surgery. By its use I have removed a carious jaw, the patient, unetherized, being unconscious that the real operation had begun. I have devised, out of a dependence on its powers, operations otherwise impossible of performance.

The bleeding again confronting us comes from the inferior maxillary artery, a vessel occupying the canal in the substance of the bone through which we have cut. A happy and reliable way of control-

ling such hemorrhage is found in using a tuft of sponge having attached to it a string designed for its future removal.

. . . A bad feature shows itself in the ramus: an extension of the



disease, as exhibited by this probe, which passes up quite three-quarters of an inch. Yet see how happily our engine applies. We change the saw for a stoned rose-drill of a diameter somewhat greater than the sinus to be reamed out. . . . The cleansing is finished, and it has taken but a few seconds of time to do the work.

The bone operation is now complete, so we turn to the cheek. What we have to do here is to dissect away all disease, together with as wide a margin of healthy structure as may judiciously be taken.

. . . The face wound is now ready to be closed. Here the indispensable is union by first intention. To secure the best chances for such union we approximate the edges with great care, using delicate steel pins for the lip and waxed gilling-net thread for the neck. . . . The closing up is now completed. We cover the side of the face with cloths saturated with dilute phénol sodique, and cover all with a Barton bandage. Even as early as to-morrow, if all goes well, I will remove one or more of the lip-pins; next day all of them, if that be possible. The sooner pins and stitches are gotten away from wounds of the face the better the chance for speedy and immediate union.

Attending the operation will be much salivation. For this I also use the dilute phénol sodique, a tablespoonful to a goblet of water. To wash the mouth requires a dentist's rubber bulb syringe. The washing may be intrusted to the patient. For his comfort he will be found pretty constant in his syringing.

NOTE.—Eight days after the performance of this serious operation the patient was so far recovered as to start on a journey of two thousand miles. Prof. Garretson remarked to the class that the repair was the most rapid he had ever witnessed. The union was absolutely by first intention.

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR meeting held at the residence of Dr. S. G. Perry, Tuesday evening, April 20, 1880.

President Dr. W. A. Bronson in the chair.

Dr. N. W. Kingsley. It is a well-recognized fact that when any individual receives distinguished honors, each and every member of the class to which he belongs becomes a partaker in those honors, and in like manner, when one member is humiliated, the whole body suffers with him.

Many of us were sorely pained last autumn by reading in the newspapers of charges which had been made against Dr. J. W. Crane, an honored member of our profession in Paris. To all those who knew Dr. Crane such a report was a severe shock, and those who did not know him felt a degree of humiliation.

I have taken some pains to inquire into this matter. I have known Dr. Crane a quarter of a century. He was a student of mine more than twenty years ago. He is the peer of most American dentists practicing in Europe,—one who enjoys the respect and esteem of a large *clientèle*, and a gentleman of high social standing. I knew his character and disposition, and I do not hesitate to say that it was simply impossible that he could have been guilty of such a crime as was charged, and furthermore the highest authority in France has completely exonerated him. The report that came here must have been instigated by envy and malice, as the only object was evidently to injure him.

I gladly embrace this opportunity of correcting such scandalous statements for the purpose of relieving the minds of our brethren throughout the world who sympathized with Dr. Crane, and to show that he is still worthy of our confidence and esteem.

Dr. W. H. Dwinelle. I would like to add a few words in the same spirit in which Dr. Kingsley's remarks have been made. I was fortunate enough to know perhaps more in regard to the attempt to shadow Dr. Crane's character than most of the gentlemen present. I heartily indorse everything said by Dr. Kingsley. I believe Dr. Crane to be as innocent of the charges made against him as it is possible for a man to be under any circumstances whatever. I believe him to be the victim of a conspiracy prompted by the most outrageous malice, and I should convince you of the truth of this statement if I were at liberty, at present, to tell you all I know of this case. As Dr. Kingsley has said, this is a matter which concerns us all, and I feel it to be my duty, as it is my pleasure, to testify to the irreproachable

character of Dr. Crane, and to publicly express my entire confidence in his innocence. If I did not *know* him to be innocent, my confidence in him is such that I should still believe him so, even in the face of overwhelming testimony.

But there is no evidence against him, and there never has been, except the testimony of a young boy whose character has been shown to be so vile that I would not venture to name to you all the crimes he has been guilty of. Such a conspiracy could not be carried out here, for in this country we hold a man innocent until he is proved guilty. Unfortunately for Dr. Crane, in France as in all the Latin countries, court decisions are comparatively final, and it is almost impossible to get a review or rehearing of a case when once decided.

The President of the French Republic has reviewed the whole matter and has put the stamp of injustice and persecution upon it, thereby completely vindicating and exonerating our friend.

INCIDENTS OF OFFICE PRACTICE.

Dr. J. W. Clowes. I rise under the pressure of a great responsibility. This society, in 1874, held a special meeting, at which was thoroughly discussed the subject of dental amalgams. I have always felt that my persistent use of this material, and what I had said regarding it prior to the meeting, had had very much to do with the attention it there received. By its employment as a filling through many years, and its *saving* quality, I had been led to declare it a "special providence," and the very *earnestness* of my declaration had stirred up certain analytical philosophers of our membership to sift, investigate, and try its merits. This meeting was composed of the very *élite* of our profession; and if its action was not a positive indorsement, amalgam, at least, received so fair a showing that its use has ever since been considered respectable. As I have declared amalgam to be a good filling, and you have pretty generally encouraged me in the declaration, and as through our action has gone forth an influence we cannot recall, you discover the reason for that pressure which constrains my present utterance: "Amalgam is a special providence." I said this of the kind I had used for many years, not of those which have recently intruded themselves upon our notice, even in our very operating sanctums. These last, as I have proved, are *specials of quite another sort*. *The hand of the good Lord is in the one, but the spirit of evil, in the shape of cadmium, is in the others*. I have written the authors of these miserable abortions and told them "*the least bit of cadmium in their preparations damns them beyond redemption*," and that the effect of its general use would be second only to a deadly pestilence in the land. They have promised to use cadmium no more. God grant they may be true to their promise, for humanity's

sake! They can't repair the mischief they have done, but they can stop.

Dr. Frank Abbot. How do you test it?

Dr. Clowes. By sight and touch. With these senses you will detect the sleek villain within. *By comely appearances I was deceived, for I did not dream that those who aspired to the manufacture of amalgam could be so ignorant as to use an ingredient which would condemn it, or so base as to betray the confidence to which they looked for support. When a dealer in amalgam comes to you with a pocket specimen (either in mass or in the cavity of a tooth) looking so fair and feeling so slippery, rely upon it the devil is there; and the sooner he is dismissed from your presence, the better for you and the patients whose interests you are sacredly bound to protect. The effect of cadmium upon a tooth is to destroy its substance, devitalize its pulp, and by solution in the oral fluids create a taste insufferably disgusting!* Unlimited as it is for mischief, the thought of its capacity for harm sickens and wounds me to the heart. As in the shadow of a great rock of the desert the weary traveler seeks and finds rest, so I turn for relief to the "dear old Lawrence," which has ever been reliable,—an amalgam without variableness and without doubt. It is with this filling I have achieved some of the best results of my professional life, and it is just and proper I should declare it. "Old," did I say? I would not have you infer that Dr. Lawrence is old. The man who manufactures so good an amalgam ought to remain young, and happy and useful for evermore. This profession is greatly indebted to Dr. Lawrence for his amalgam.

Dr. Benjamin Lord. Have you tested either of the amalgams as regards their strength out of the mouth?

Dr. Clowes. I have a peculiar way of testing amalgam. Having triturated with the finger in the palm of my hand the component parts to a putty-like mass, I press it between my thumb and finger until a thin edge is obtained. After allowing it to set, I judge of its quality by the strength of this edge. Filling glass tubes I consider "foo-foo," and of no earthly use or importance whatever. With Oliver's amalgam I have not been long acquainted, but as far as I know I am pleased, and it may possibly become in the future a successful rival to the one on which I have so long and reliantly based my faith.

Dr. E. A. Bogue. Is there cadmium in the amalgam that lately received Dr. Clowes's indorsement, and which was carried with his card attached to it?

Dr. Clowes. *I have in no wise indorsed the amalgam referred to, neither have I authorized my card to be presented in connection with it. It undoubtedly contains cadmium, and is slippery and quick-setting.* I was deceived by its appearance, and especially by the

plausibility and assertions of its author. It may represent an "ideal," but its order is very low.

Dr. Kingsley. Is not Oliver's a good amalgam?

Dr. Clowes. Verily, I think it is. I have the very best impressions regarding it.

Dr. Bogue. When Dr. Clowes squeezes amalgam and puts it aside to set, how does he know when he gets the strongest edge? and if he does get it, is that the most necessary or desirable quality in an amalgam for filling teeth?

Dr. Clowes. *A strong edge shows a dense setting. The greater the density, the less the shrinkage and expansion.* My opinion of filling glass tubes has already been given. The best test of any filling is its *saving effect for many years upon a tooth.* . . .

Dr. Dwinelle. I would like to ask how it is that Dr. Clowes knows that cadmium in a minute quantity will be objectionable in an amalgam, *as cadmium*. In other words, I undertake to say that, upon the principle of catalysis, or mere presence, an imperceptible quantity of an element may be combined with other elements, so as to change the entire character and quality of the new combination, and yet in no sense can there be an objection to the presence of that article. For instance, I believe that an amalgam can be made of gold, silver, and tin with one grain to the ounce of cadmium, which will give to that composition desirable and unusual qualities, and yet never be objectionable as cadmium. I admit the proposition that the doctor lays down, that cadmium, *as cadmium*, in an amalgam is objectionable. What I mean by that is, when you put it in in sufficient quantity, so that it operates as cadmium. When it is put in in infinitesimal quantities, so that it comes in as a mere presence, I say I believe that in that case cadmium is not more objectionable in the amalgam than tin or silver itself. On the contrary, I believe it will be demonstrated that it will produce an amalgam unsurpassed. It will make it tough, homogeneous, light in color, and non-shrinking to a degree not before attained. The principle of catalysis is represented by this one of many examples: Give me an unlimited amount of starch, a limited amount of sulphuric acid, and I will manufacture sugar in unlimited quantities, and at the end of a year I will return every drop of the sulphuric acid. It only needs the presence of the acid to produce this result. I have always been an advocate of amalgam under certain circumstances, and I can show excellent fillings made with it thirty-five and forty years ago. One of the recent amalgams has been said to contain no cadmium. This was said with a qualification. In an objectionable sense there was none, but as an element of expressed catalysis there was. Properly employed, arsenic is one of the most useful articles in the *materia medica*. Shall we discard it

because in larger doses it is a poison? Shall we stop eating peaches because they are known to contain prussic acid?

Dr. Clowes. My friend Dr. Dwinelle is a gentleman of great capacity and eminent parts, but be not beguiled by his catalytic arguments. Let not his siren voice lead you astray and persuade you to use any amalgam which catalyzes cadmium. It is no slight cause that impels me to speak to you this night. Cadmium in amalgam is a great peril to our profession. It is damage and loss to our patients, and its employment in their mouths a crime without palliation and without excuse.

Dr. O. E. Hill. Dr. Clowes dogmatically asserts that Lawrence's amalgam is the best, and yet he admits that he has never made any tests with it out of the mouth. The time has come when a man must be able to give a reason for the opinions he holds, and I do not think it sufficient for Dr. Clowes to say that long use of an amalgam in the mouth is as safe a guide as the tests that can be made with glass tubes with which uniform conditions can be secured.

Again, Dr. Clowes claims long use of Lawrence's amalgam as a reason for his belief in its superior qualities, and yet he indorses Oliver's amalgam, which has only been in use for a few months.

If you will try them in glass test-tubes, you will find that they both shrink.

The value of an amalgam filling is determined for the most part by its shrinkage, and it is possible to determine the amount of this shrinkage more accurately by these glass-tube tests than by observation of fillings in the mouth, where the conditions may never be twice alike.

In this connection there is another point I will refer to. I want to condemn the easy habit that many of our eminent men have of too hastily indorsing new things. I have several times been pained to see good names appended to articles that had not been long enough in existence to test their value. The indorsements of men of experience have great weight in the profession, and care should be taken in giving them to dealers, who are certain to make the greatest possible use of them.

Dr. T. L. Buckingham, of Philadelphia. I do not know that I have anything new to offer on the amalgam question. We all use amalgam more or less. When it was condemned so strongly by the dental profession some used it quietly. We wanted to act in harmony with the American Dental Association, but that body disapproved of its use. Since that time its use has been growing, and I am sorry to say that now we are running to the other extreme. I do not apprehend any danger from the older dentists using it, but the recommendations they are giving to the young men may do a great deal of harm. I think

these recommendations should be given cautiously, and they should be qualified. I suppose all agree that gold fillings properly inserted will save teeth in ordinary cases as well as any other material, and it only requires skill and time to do the work well. Every one will admit that they look much better, and in every way are better. But I think that teeth are filled with gold by some operators which could be filled better with amalgam or some other plastic material. Until recently the use of gold was advocated so strenuously that men were afraid to admit the use of amalgam. The process of filling with gold was carried to such perfection that we could not conceive of any improvement in the work. Then a reaction took place and another extreme was reached, which has brought us to what is now called the "New Departure." It claims that plastic fillings are better than gold. Many young men take advantage of this, and point to the reports of dental societies and say they recommend amalgam in preference to gold.

In regard to the different kinds of amalgam, the one Dr. Clowes speaks of is nothing but what is called Townsend's amalgam. It is not a proper name. Dr. Townsend never made an amalgam. He was in Cincinnati and met some dentists who were using an amalgam and washing it in alcohol. They recommended it to him very highly. When he came home he made a long report to the Pennsylvania Association, giving the formula, which was,—tin, five parts; silver, four parts. He was an enthusiastic man. When he took hold of amalgam he went to the extreme, and it was not more than a year before he was ready to take back all he had said in its favor. The amalgam Dr. Clowes speaks of has been analyzed and found to be composed of coin silver four parts, and tin five parts. The coin silver contains one-tenth copper. It is difficult to make a uniform alloy of silver and tin. It is a question whether the metals unite and form chemical compounds or are merely mixtures. You may mix silver and tin together in any proportion, but, as the silver crystallizes at a much higher temperature than the tin, it sets first with a portion of the tin, while another part of the ingot will be nearly all tin. This is most likely to be the case when a large quantity is being melted at one time.

The manufacturers of amalgam claim to have some secret about the composition or the manner of preparation which makes theirs superior to any other in the market. One who makes large quantities has said, "If I tell the formula and process, others could not make it as well as I can, and it is much better to let me manufacture it." Amalgams are intrinsically worth about seventy-five cents an ounce. With a little tact we can make them for our own use. I have made my own for a number of years, and have tried nearly all the formulæ

I could obtain. The one given as Townsend's I have found as satisfactory as any.

In regard to the amalgam containing cadmium I cannot say much. Some that I used years ago turned yellow. As to what one of the speakers has said in regard to cadmium making the amalgam more uniform, and changing the chemical affinities of tin and silver and thereby making them more harmonious with the tooth-structure, we may theorize, but we can only arrive at definite conclusions by testing; and this must be done in a number of cases. I do not place much faith in the tests we have for leakage, especially when tried in glass tubes. All fillings must become moist on the bottom, even if kept dry when placed in. There is at least ten per cent. of moisture passing in every direction through the dentine, and no filling can be kept dry at the bottom, let it be placed in ever so well. This is shown by amalgam fillings becoming black on the surface next the dentine, the color being due to the sulphur in the circulating fluid.

Dr. Clowes speaks of testing the edge of amalgams by allowing them to set after the mercury has been squeezed out, and then noticing the resistance the edges may offer. I think this would depend upon the quantity of mercury squeezed out; if more was left in than was necessary to solder the mass together, the extra amount would certainly weaken the edges.

Tests have been made by pressing the mercury out under a pressure of sixty pounds to the square inch, and it has been found that a certain amount would remain. I think we ought to be very careful in the use of amalgam. In the hands of those who have been in the habit of using it, cases can be selected where it would be the most suitable filling. I have used it in all teeth, but not in the same mouth. Sometimes I have used it because the cavity was so large that I could not afford to use gold; in other cases, where the patient was willing to pay any amount, but the teeth were so frail that I thought amalgam would make a better filling. We must use discretion and be eclectic in our practice. Those who use nothing but gold do not always do the best for their patients, and those who use no gold do worse.

Dr. Bogue. Have you ever used gum-copal dissolved in ether, as recommended by Mr. Fletcher?

Dr. Buckingham. No, sir.

Dr. Bogue. The objections to discoloration are of such force that it seems to me a little remarkable that copal varnish is not more universally used for coating the cavity walls before introducing the filling. So far as I know, it has been used only three or four years. Where it has been used the fillings I have met the second time have

not discolored the teeth. I don't know what they are underneath, for I took none of them out.

Dr. C. F. W. Bödecker. I here show a microscope that for two years I have been using for the examination of fillings in the mouth. To the lower part of the main tube (body) the objective is attached by means of a long screw, with which the fine adjustment is obtained. A little above this is a bar, which rests on the tooth or object to be examined. This, also, is movable, and with it the coarse adjustment is made. In the upper part of the body is placed the eye-piece. The instrument was made by Mr. Grunow, optician, of New York.

I also have here a model of the upper jaw of a young man, seventeen years of age, for whom last November I extracted the first left molar. Yesterday I saw him again, when, to my surprise, there was present a third bicuspid in the place from which the molar had been removed. The new tooth is a well-formed one, just like the other bicuspids. I also have here a model showing two wisdom-teeth on one side.

Dr. Dwinelle. At our last meeting I reported a case where the two front teeth were broken off in the mouth of a child some nine years old. The eye-teeth were not developed and the teeth generally were in a mixed-up condition, the permanent teeth being only partially developed. Here is a very rude model I promised to bring you of the case before the operation, and a model of the case after the operation, showing that in drawing down the two front teeth the gums were not drawn down so as to be perceptible, and yet, as you will perceive, the restoration is complete and permanent.

The following paper on the "Development and Growth of Dentine" was then read by Dr. T. L. Buckingham:

From observations that I have made, and from the study of various authors who have written on the development and growth of dentine, I have come to certain conclusions differing from the generally received opinions. These conclusions I will endeavor to present in as short and concise a manner as possible. It may be necessary to explain how I shall use certain terms and names. Unfortunately, the nomenclature of investigators is not uniform. It is necessary usually when studying an author to first become acquainted with the terms he uses and the ideas he wishes to convey by them.

The beginning of all organized tissue is the cell; at least they all pass through the cell-formation. I shall make this the starting-point. At the very commencement we must understand what a cell is; for, although the cell-theory has been almost universally recognized for more than fifty years, the cell—its formation and growth—is yet so

differently described by different writers that it is requisite first to study what the writer intends to convey by the term. Therefore I want to give an explanation of a cell and what constitutes it as I shall use it.

Virchow describes a cell as consisting of cell-wall, cell-contents, and nucleus.

Beale describes it as being composed of germinal matter and formed material, being in the earlier stages all germinal matter, but in time the outer surface becomes more dense and loses its property of reproducing living matter. I shall follow the theory of Beale more closely than that of any other writer.

Cells multiply in various ways. It is not necessary for my purpose to describe the process, but what I want to say is that when cells multiply they produce others similar to themselves. The offspring is always like the parent, and all organized tissue is produced from cells.

Virchow, in his "Cellular Pathology," page 54, says: "No development of any kind begins *de novo*; consequently, we have to reject the theory of equivocal or spontaneous generation just as much in the history of the development of individual parts as we do of the entire organism." "Where a cell arises, there a cell must have previously existed, just as an animal springs from an animal, a plant only from a plant."

Yet when it becomes necessary to form a new tissue a different cell must be either created or one transformed into another having different properties from the one which produced it. When this metamorphosed cell multiplies it produces cells like itself. I do not believe that one tissue, in the ordinary operations of nature, produces another differing from itself.

Having now explained what a cell and its functions are, we can proceed to give the views of different authors on the origin and growth of dentine.

The elder Tomes, in his work on "Dental Physiology," published in 1853, says (page 84): "The dental pulp, from its earliest appearance to the time of its transition into dentine, is mainly composed of a series of nucleated cells, united and supported by plasma, is supplied with vessels, and during a greater part of its existence with nerves. In the second or cellular stage of the dental pulp the cells have no definite arrangement as regards each other, but are thickly scattered at pretty regular intervals throughout the whole section. Immediately preceding the conversion of the pulp into dentine the pulp undergoes a third change. The component cells acquire a linear arrangement. Those near the coronal surface are the first to take this position. The so-formed columns are, as regards the pulp, nearly vertical to its coronal surface and lie nearly parallel

to each other, holding, in fact, the same relative position amongst themselves as do the dentinal tubes of the corresponding part of a perfected tooth."

Mr. Charles S. Tomes, in his work on "Dental Anatomy" (page 3), says: "This vascular pulp may be continually being converted into new dentine, and as constantly being itself reproduced at its base, in which case we have a tooth of perpetual growth." On page 95 he further says: "The tooth-pulp, occupying the central chamber or pulp-cavity, is the formative organ of the tooth. The cellular elements of the pulp are arranged, as seen in the transverse section, in a direction radiating outwards from the center. This is most marked in the highly-specialized layer of cells which form the surface of the pulp, and are termed odontoblasts. The odontoblast layer, sometimes called the *membrana eboris*, because it usually adheres more strongly to the dentine than to the rest of the pulp, and is, therefore, often left behind upon the dentine when the pulp is torn away, consists of a single row of large elongated cells of darkish granular appearance, with large and conspicuous nucleus near the farthest end from the dentine."

I take exception to the theory of these two histologists, that the dentinal pulp is the formative organ, and that the dentine is formed from the cells of the outer layer of the pulp. That the dentine is formed between the pulp and what is called the preformative membrane all admit, but that either of these produce it I doubt very much. My theory is, in regard to the origin of dentine, that either a peculiar cell is created or one is metamorphosed into a dental cell, which is the parent of all others, and it multiplies in some one of the ways that cells multiply in other tissues. They arrange themselves so as to form the organ in the size and shape required. The new cell being at first all germinal matter, it soon begins to harden on the outer surface, and the most of it becomes formed material, but there always remains a portion of germinal matter, which is pushed towards the pulp and continues to grow in this direction, leaving behind it the hardened portion and a small fiber of germinal matter. By this theory a single cell would form the whole length of the dentinal tube. This differs from the theory of others who think the tube is made up of a number of cells joined together. As the space at the periphery of the dentine is greater than nearer the pulp, and as the cells are all about the same size, more of them would consequently start at the periphery than could arrive at the pulp. When this crowding together takes place to a certain extent two cells coalesce, and in this manner branches are formed.

We can account in this way for the pulp-cavity being lined with odontoblasts, they being the germinal matter of the original cell at-

tached to the pulp by connective tissue. When the pulp is removed they frequently come away with it, and appear as a part of it.

This fiber of germinal matter is the active part of the dentine, and in normal condition is never obliterated entirely. The formed material is a cartilaginous substance, and fills in between these fibers. This becomes calcified and gives hardness and firmness to the structure.

Let us examine this process of calcification. It is not merely a deposit, as a sediment would settle, or the deposition of calcareous matter on the inside of a tube, nor can we say it is crystallization unless we consider the original molecule a crystal. It is a deposit of the molecules of lime-salts in the cartilaginous tissue. This tissue was first all germinal matter which could be stained with carmine. It was first so porous that the granules of carmine could pass into it, but when hardened into a soft-solid tissue it was too dense for the carmine to penetrate, yet still it retained sixty to seventy per cent. of water.

A molecule of water is as solid and incompressible as a molecule of steel. In fact, the molecules of all chemical compounds are supposed to be perfectly solid. Variations in the cohesive force give masses the different degrees of hardness; perhaps crystallization has some effect. As a molecule is always composed of the same number of atoms united in the same manner, they must necessarily occupy the same space, and are not subject to expansion or contraction, as are the masses of molecules.

In the semi-solid cartilage there must be cavities or spaces where one or more molecules of water are lodged. When the circulating fluids, containing lime-salts in solution, are brought in contact with the water, the salts displace it and are retained in these cavities. But you may ask, How do we explain the circulation through the tissue? It was formerly thought that what we now consider fibers of germinal matter were open tubes and the fluids circulated through them. We now know there are no empty tubes in the dentine during life. The circulation must be by osmosis, and it passes in every direction. This kind of circulation is not confined to the osseous tissue. All animal structure is pervious to watery fluids containing crystallizable salts. When these soluble salts come into the cellular cavities the fluids are changed in some way by the vital force so that the salts are deposited while the fluid passes on. Would this cause a circulation? It appears merely to be a diffusion. We can illustrate this circulation best by the sap in a tree. The roots take up the watery fluids of the soil, containing various salts in solution, which are carried to the leaves. The solution is there changed by the action of air, light, and heat, and the changed solution, after depositing certain constituents, is returned to the ends of the roots through the same

set of vessels that carried it up. A similar current takes place in the animal tissue, only the fluid does not return through the same set of vessels. Each organ through which the circulation passes selects material to build and nourish the structure.

The calcification commences in the outer and oldest portion of the formed material, and is shaded gradually in. It does not become completely calcified at once, but layer after layer of salts is deposited until all the formed material is calcified, the process continuing a long time. We all know that the dentine of young persons is not so dense as that of adults, and the calcification, when nearly arrested by maturity, is set up again when the tissue is excited by abrasion or decay. The hardening process does not extend into the germinal fiber, but leaves a portion of cartilage, so that the fiber is surrounded by a tube of uncalcified cartilage as is shown by J. Tomes, in "Dental Physiology," pp. 39 and 40, and by Chas. Tomes, p. 60. There are some peculiarities about this cartilaginous tube in that it is more dense than the part that has become calcified, which may be shown by dissolving out the lime-salts with hydrochloric acid, when the cartilage will appear fibrous, if torn apart. It is possible that the salts deposited in the cartilage destroy in a measure its cohesiveness, and probably the tubular structure is made more dense by the pressure of the calcified part.

Owing to the lateness of the hour, discussion of Dr. Buckingham's paper was deferred until the next meeting.

Adjourned.

CORRECTION.

TO THE EDITOR OF THE DENTAL COSMOS.

DEAR SIR,—I have just received a letter from Dr. Rogers, of London, calling attention to two errors in my description of the method by which he made some copper amalgam for me.

He says, "The solution of sulphate of copper should be attenuated to an extremely pale color, instead of being left concentrated as in the report in the DENTAL COSMOS for April, 1880, page 196; the more the solution is attenuated the finer will be the precipitate. Again, *iron* plates should be used for precipitating, and not the zinc; zinc makes the stopping dirty, and is to some extent taken up by the mercury, whilst iron is not."

Will you kindly make the correction for the benefit of those who may wish to manufacture a copper amalgam that is valuable, and oblige,

Yours truly,

E. A. BOGUE.

NEW YORK, June 8, 1880.

KANSAS STATE DENTAL ASSOCIATION.

THE ninth annual meeting of the Kansas State Dental Association was held at Emporia, Kansas, on the first Tuesday in May, 1880. The following officers were elected for the ensuing year:

President.—W. H. Shulze, Atchison, Kansas.

1st Vice-President.—A. H. Thompson, Topeka, Kansas.

2d Vice-President.—S. P. Huntington, Eureka, Kansas.

Secretary.—J. A. Young, Emporia, Kansas.

Treasurer.—J. D. Patterson, Lawrence, Kansas.

Delegate to the American Dental Association.—A. H. Thompson, Topeka, Kansas.

Adjourned to meet at Topeka on the 1st Tuesday in May, 1881.

J. A. YOUNG, *Secretary.*

AMERICAN DENTAL ASSOCIATION.

THE American Dental Association will hold its twentieth annual session August 3, 4, 5, and 6, 1880, at the hall of the Massachusetts Institute of Technology, Boston, Mass. Hotel accommodations have been provided at the "Brunswick," Boylston corner of Clarendon Street, opposite the Institute. Rates three dollars per day, reduced from four dollars and a half. This hotel is new and first-class in every appointment. The hotel and hall are in near proximity to the business part of the city, yet free from the noise and turmoil necessarily incident to the business streets. The committee of arrangements feel sure they will be able to provide opportunities to make the stay of members pleasant, and the meetings of the association profitable.

THOMAS FILLEBROWN,
Chairman First Div. Ex. Com.

AMERICAN DENTAL CONVENTION.

THE twenty-sixth annual meeting of the American Dental Convention will be held in New York city on the second Tuesday in August.

AMBLER TEES, *Secretary.*

CALL FOR A MASS CONVENTION OF THE DENTISTS OF THE UNITED STATES TO ORGANIZE A NATIONAL DENTAL ASSOCIATION.

At their annual meetings in 1879, the Southern Dental Association and the American Dental Convention each appointed a committee invested with full power to adopt measures for the formation of a National Dental Association. The American Dental Association at its meeting in the same year appointed a committee to confer with these two committees on this movement and report to the association at its meeting in Boston, August 3, 1880. Members of these committees met at Saratoga in August, 1879, and elected Professor J. Taft General Chairman.

The committees are as follows:

Southern Dental Association.—R. Finley Hunt, Chairman, Washington, D. C.; T. T. Moore, Columbia, S. C.; S. J. Cobb, Nashville, Tenn.; T. S. Waters, Baltimore, Md.; J. R. Walker, New Orleans, La.; F. J. S. Gorgas, Baltimore, Md.

American Dental Convention.—R. B. Winder, Chairman, Baltimore, Md.; J. G. Ambler, New York, N. Y.; F. A. Levy, Orange, N. J.; J. Taft, Cincinnati, Ohio.

American Dental Association.—A. W. Harlan, Chairman, Chicago, Ill.; C. N. Peirce, Philadelphia, Pa.; F. H. Rehwinkel, Chillicothe, Ohio; H. J. McKellops, St. Louis, Mo.

A meeting of chairmen was held in New York, May 11, 1880, at which were present Professor R. B. Winder, Dr. R. Finley Hunt, and Professor C. N. Peirce, the latter representing (by proxy) Professor J. Taft, General Chairman. Prof. Peirce was also present as a member of the committee of the American Dental Association.

This meeting, in accordance with the powers and duties intrusted to the committees, decided to call a Mass Convention, and fixed the time and place of meeting, Wednesday, August 11, 1880, at 11 o'clock A.M., in the City of New York, for the purpose of organizing a National Dental Association, to be composed of members of every State society in the country.

A constitution and all necessary regulations will be prepared by a sub-committee, and submitted for revision to a meeting of the full committees, to be held in the same city at 9 o'clock A.M., on Monday, August 9, 1880, so as to be thoroughly prepared for the action of the mass convention.

The importance of this measure requires that the whole time of the convention shall be devoted to the business of organization.

All members of State societies and associations, and those intending to become members, are cordially invited to be present at this mass convention and take part in its proceedings.

As this proposed National Association is intended to promote the best interests of the whole profession of the country, it is important, and is especially urged, that every State in the Union be represented by as large a number of dentists as possible.

It is hoped, therefore, that *every* dentist in the country who can *possibly* go to New York at that time will be present.

The following executive committees have been appointed to act together and make all arrangements for this meeting, such as procuring a hall, hotel accommodations, reduction of railroad fares, etc.

By American Dental Convention.—J. G. Ambler, New York, N. Y.; Charles Merritt, New York, N. Y.; H. Townsend, Philadelphia, Pa.; J. H. Smith, New Haven, Conn.; E. D. Fuller, Peekskill, N. Y.; G. A. Mills, Brooklyn, N. Y.

By Southern Dental Association.—W. H. Atkinson, New York, N. Y.; S. J. Cobb, Nashville, Tenn.; J. W. Selby, New York, N. Y.

By New York State Dental Society. To co-operate with other committees.—O. E. Hill, Brooklyn, N. Y.; L. S. Straw, Newburgh, N. Y.

J. TAFT,

General Chairman.

R. B. WINDER,

Chairman Com. of A. D. C.

R. FINLEY HUNT,

Chairman Com. So. Dental Ass'n.

IOWA STATE DENTAL SOCIETY.

THE eighteenth annual meeting of the Iowa State Dental Society will be held at Oskaloosa, commencing on Tuesday, July 13, 1880. Dentists in this and other States are cordially invited to meet with us.

E. E. HUGHES, *Secretary.*

PENNSYLVANIA STATE DENTAL SOCIETY.

THE twelfth annual meeting of the Pennsylvania State Dental Society will be held at Bellefonte, Pa., commencing on Tuesday, July 27, 1880, and continuing three days. The hotel rates to those in attendance will be reduced to \$1.50 per day for first-class accommodations. For orders for excursion tickets, or other information, apply early.

All dentists are invited.

G. W. KLUMP,

Corresponding Secretary,

Williamsport, Pa.

PENNSYLVANIA STATE DENTAL EXAMINING BOARD.

THE Pennsylvania State Dental Examining Board will hold its annual meeting for the examination of applicants at Bellefonte, during the session of the State Dental Society, which convenes Tuesday, July 27, 1880.

Applicants will be required to show specimens of work in both the operative and mechanical departments.

C. N. PEIRCE, *Chairman.*

CENTRAL PENNSYLVANIA DENTAL ASSOCIATION.

THE annual meeting of the Central Pennsylvania Dental Association will be held at Bellefonte during the session of the State Society, at that place, in July, 1880.

J. C. M. HAMILTON, *Secretary.*

MAINE DENTAL SOCIETY.

THE fifteenth annual meeting of the Maine Dental Society will be held in Portland, Tuesday, July 20, 1880. At its last annual meeting the society adopted an amendment to the by-laws, so that semi-annual sessions are no longer held. The annual meetings are on the third Tuesday in July.

DANA W. FELLOWS, M.D., *Secretary.*

EDITORIAL.

ARTISTIC DENTISTRY.

WE take great pleasure in presenting in this issue of the DENTAL COSMOS the first of a series of illustrated papers under the title of "Esthetic Dental Prosthesis." The subject is one whose importance should have secured for it far more attention at the hands of the profession than it has received. It is, indeed, surprising how small a space in dental literature it has occupied; how little consideration it has received in dental conventions; and more surprising still how relatively inadequate have been the teachings concerning it in dental schools. It is not strange, therefore, that most of the mechanical dentistry of to-day is inferior to that which was produced years ago.

Though it will not be disputed that if, in the education of the dentist, any particular qualification is to be ignored, manipulative skill

should be considered absolutely essential, yet, because the work of the office is considered more professional than that of the laboratory, it has come to pass that the term "a first-class jeweler," applied to a dentist, is meant to be derogatory rather than complimentary. Many of our "best operators" frankly admit not only their ignorance, but their dislike, of the details of the mechanical branch of their profession. The construction of an artificial denture is therefore passed over either to a student, a hired assistant, or to a so-called "mechanical dentist." The highest ideal, even of those who aspire to be dental mechanics, has perhaps generally had more regard to comfort and usefulness in an artificial denture than to artistic considerations. The accurate fitting of a base plate, and the neat adjustment of the teeth upon it; a proper occlusion of the same with the opposing teeth; the restoration of impaired functions—speech and mastication; these have too generally satisfied the ambition of the dental mechanician, and the esthetics of replacement have been too little studied. Without a due appreciation of the principles which should determine the selection and arrangement of a set of teeth, no subsequent care or skill can secure an artistic success. So that, even when a judicious selection of teeth has been made, so far as size, shape, and color are concerned, and their subsequent attachment to a well-fitting plate has been secured, the result is, from lack of artistic perception of the individual characteristics of the patient, the conventional "picket-fence" set of teeth, recognizable as artificial not alone by the trained eye, but even by the careless observer. The physical characteristics of each patient must be carefully studied in the light of an intelligent appreciation of the law of correspondence in order that substitutes for lost natural organs should be in harmony with such characteristics. A lack of such correlation is displeasing, the inharmony being recognized even by those who do not understand the cause.

The size, shape, and color of the teeth, their alignment and articulation, should be considered in every case with reference to the age, sex, height, weight, complexion, countenance, family peculiarities, etc., of the patient. It is far easier to caricature an individual in the selection and arrangement of dental substitutes than it is to restore the familiar expression. The failure to adapt a denture to the special case, to preserve the harmony of facial requirements, is so common that generally no one need remain in doubt as to whether in any given case the teeth are false or otherwise. If not natural, *false* they generally are, in the worst sense of the word.

For this condition of things there is really no justification. It is entirely possible, by the study of physiognomy, of the muscles of expression, of esthetic anatomy, to avoid the glaring incongruities so constantly met with in artificial dentures, and to add to usefulness

the charm of naturalness. We trust that the subject will receive increased attention, and that artistic dentistry may ere long be the rule instead of the exception.

THE FRAUDULENT DIPLOMA TRAFFIC.

It has been for several years an open secret that diplomas in medicine, dentistry, law, theology and arts could be had without attendance upon lectures, without examination as to fitness, and without any regard to the qualifications of the applicant. The degrees of M.D., D.D.S., D.C.L., LL.D., D.D., etc., have been a matter of purchase and sale. Many such diplomas *in absentia*, as they are commonly known, have been granted, the only essential on the part of the applicant being the ability to pay the amount of purchase money involved; and they are now held by their purchasers as vouchers of qualification, and as a basis of practice or as evidence of honor conferred.

The issue of these fraudulent diplomas has brought undeserved discredit upon American degrees, especially in medicine and dentistry, and has probably been the cause of the discriminating legislation against them which has obtained in some European countries.

Philadelphia has been the headquarters of a class of men who for a pecuniary consideration, often contemptible for its smallness, would license unqualified men to prey upon suffering humanity. The principal establishments for the granting of bogus diplomas of late years have been known as the American University of Philadelphia (and) Eclectic Medical College of Pennsylvania, 514 Pine Street, John Buchanan, M.D., Dean; the Philadelphia University of Medicine and Surgery, 209 North Tenth Street, T. B. Miller, M.D., Dean; and the Livingstone University of America. This latter appears to have been distributed to various parts of the country. The Department of Arts was located (on paper) at Haddonfield, N. J.; the Department of Theology and Law (on paper) at Charlestown, W. Va.; and the Medical and Dental Departments at Philadelphia. The address of the secretary was James Murray, D.D. (an alias of John Buchanan, above mentioned), Haddonfield, N. J.

The authorities of the city and of the State, having had their attention called again and again by the public press to this infamous trade, have heretofore made only spasmodic and ineffectual efforts for its suppression. At last, however, owing to the enterprise and perseverance of the proprietor of a daily newspaper, the *Philadelphia Record*, the nefarious traffic seems likely to be effectually stopped. Some months since the *Record* contained an exposure of the Philadelphia University of Medicine and Surgery. It then turned its attention to Buchanan, who was easily in audacity and in the extent

of his operations at the head of the business. . An agent of the *Record*, under assumed names, and with the assistance of a special officer of the post-office department, led him into the trap which had been set, and carried on his negotiations so skillfully that he succeeded in obtaining for the sum of \$225 eight diplomas, as follows:

One diploma of M.D., from the Eclectic Medical College.

Two diplomas of M.D., from the American University of Philadelphia.

One diploma of M.D., from the Livingstone University of America.

One diploma of M.D., from the National Eclectic Medical Association.

One degree of D.D., from the Livingstone University.

One degree of LL.D., from the American University.

One degree of D.C.L., from the Livingstone University.

As the correspondence relating to these was carried on through the United States mails, Buchanan was thus made liable for setting up a scheme and artifice to defraud, and using the United States mails for this purpose; the scheme consisting of obtaining money by professing to confer degrees for a pecuniary consideration. Under this charge he was committed in default of \$10,000 bail for his appearance at the United States Circuit Court on the third Monday in August, and the State authorities lodged a further detainer under \$3000 bail on the charge of forging the names of his associates.

The *Record* claims to hold the proof that over three thousand diplomas have been issued by Buchanan from his assortment of colleges and universities, and publishes a list of some six hundred names of graduates (?) from Miller's (late Paine's) "university." A very large proportion of these frauds were *exported*, Germany having shown a degree of enterprise in their procurement beyond that of any other nation.

But it looks as though Buchanan's race as a manufacturer of titles has been run, and that with his permanent incarceration in the penitentiary the trade in degrees which has been such a glaring disgrace to the city will be suppressed. The Court of Common Pleas has granted a writ of *quo warranto* against the officers and trustees of the Philadelphia University of Medicine and Surgery, which is made returnable June 26, commanding them to show by what authority they exercise the duties, franchises, and privileges of such corporation; also, against the American University of Philadelphia, and the Eclectic Medical College of Pennsylvania, returnable June 28.

The holders of diplomas from any of the institutions named will not be likely to take any special pains to hand them down to posterity, and we may hope that ere long these fraudulent sheepskins will be "out of print."

OBITUARY.

ACTION OF THE DENTAL PROFESSION WITH REFERENCE TO THE DEATH OF DR. S. S. WHITE.

GEORGIA STATE DENTAL SOCIETY.

A COMMITTEE of the society, consisting of Drs. John H. Coyle, Samuel Hape, George W. McElhaney, J. P. Holmes, and R. W. Thornton, reported the following resolutions, which were received and adopted by a rising vote :

WHEREAS, The great Creator in His inscrutable wisdom has removed from a sphere of usefulness in this life to the life beyond the grave Dr. Samuel S. White, of Philadelphia, who was known to the dental profession throughout the world ; therefore,

Resolved, That the Georgia State Dental Society recognized in Dr. S. S. White a most efficient and devoted laborer in the cause of dentistry ; a high-toned, honorable, and consistent gentleman ; true and manly in his friendship, as well as in his business relations, making his life a shining example of usefulness worthy of imitation.

Resolved, That this society deeply deplore the loss of one so prominent and so useful to the profession of dentistry, and extend their heartfelt sympathies to the bereaved family, with the assurance of their high appreciation of his many virtues and the hope that these slight expressions of heartfelt esteem for one whose loss is so deeply deplored by the whole dental profession may have the effect to partially assuage their grief.

R. A. HOLLIDAY, *Recording Secretary*.

THOMAS BELL, F.R.S., F.R.C.S., F.Z.S., F.L.S.

MR. THOMAS BELL, whose death we recorded last week, was the son of a surgeon in large practice for more than fifty years at Poole, in Dorsetshire. He was born on the 11th of October, 1792. He commenced his professional studies with his father. In 1813 he proceeded to London, and attended the practice of Guy's and St. Thomas's Hospitals in the time of Mr. Cline, Sir Astley Cooper, Mr. Travers, and other celebrated surgeons of that period. In 1815 he passed the College of Surgeons, and in 1817 began lecturing at Guy's Hospital on the Anatomy and Diseases of the Teeth. He was appointed at the same time Dental Surgeon to the Hospital. He also gave lectures on Comparative Anatomy in the same school. Mr. Bell resided for many years in New Broad Street, City, and had a large and select practice as a dentist, and attained a very high position in the scientific world. In 1836 he was appointed Professor of Zoology in King's College, London, when he ceased his lectures on Comparative Anatomy at Guy's. He was elected a Fellow of the Royal Society in 1828, and in 1848 was chosen secretary of that body, and held the

office till his election as President of the Linnæan Society, in 1853. Mr. Bell became an Honorary Fellow of the Royal College of Surgeons in 1844, and was formerly one of the Board of Examiners in Dental Surgery at the College. Besides numerous contributions to the Transactions and Proceedings of the Zoological and Linnæan Societies, he was the author of a work on the "Anatomy and Diseases of the Teeth," "History of British Quadrupeds," "History of British Reptiles," Gilbert White's "Natural History of Selborne," published in 1876. He gave up practice some years back, and retired to the Wakes at Selborne, Gilbert White's house, which he had purchased from the family of the naturalist, and where he died on the 13th March, in the eighty-eighth year of his age.—*The Lancet*.

PERISCOPE.

RADICAL TREATMENT OF ALVEOLAR ABSCESS.—A human tooth is composed of four principal tissues: 1st, The pulp; 2d, The dentine, made up of tubes more or less calcified, containing substances having functions analogous to those of nerves, and radiating from the pulp through it in vast numbers; 3d, The cementum, clothing the outside of the root portion of the dentine, and nourished principally by the pericementum; 4th, The enamel, covering the crown portion of the dentine, and nourished from the pulp through the dentine.

As the nourishment of the enamel and dentine depends upon the pulp, and the cementum is principally nourished by the periodontal membrane lining the socket, a pulpless tooth is not necessarily entirely dead; for, although the enamel and dentine be lifeless, the cementum may continue to live and preserve the usefulness of the organ. This is the condition of a so-called abscessed tooth. Alveolar abscess is a disease outside of a tooth, and located in some portion of the socket, generally at the bottom.

An acute alveolar abscess, in process of formation, is generally, though not always, accompanied by pain and swelling in the region of the diseased part. Speedy relief by local depletion or by the letting out of pent-up pus (if it be present) should be afforded, to avoid destruction of surrounding tissue.

Of course the shortest route to a cure and the most radical treatment of the disease lies in the extraction of the diseased tooth; but unless it is worthless, or the condition and circumstances of the patient demand it, such treatment would be far from justifiable. It would be like amputation of the finger to get rid of whitlow. The grand object of dentistry is to save teeth, not to destroy them.

It is not my purpose to dwell upon the "let-alone plan," the endurance of days of agony and sleepless nights, and the destruction of tissue which follows. Should this plan, however, be adopted, care should be exercised to avoid external opening on the face. If poulticing be resorted to, it should always be applied to the gum, and not

to the outside of the face; but either plan is a long way out of the difficulty.

Alveolar abscess may be the result of blows upon a tooth, or perhaps of the so-called Riggs's disease, leading to detachment of the pericementum from the tooth, but generally abscesses arise from death of the pulp. There may be, however, causes such as lead to abscesses in other parts of the body, which are sometimes unassignable, but they are so rare that a lifetime of practice may not see one. Such alveolar abscesses are generally located on the sides of roots of teeth, without necessarily involving the pulp. As stated before, socket abscesses generally arise from decomposition of the pulp or from a foreign substance pent up in the pulp-canal, or perhaps from the decomposition of the internal or possibly of the apical portions of the root.

The decomposition of the pulp causes evolution of gas, requiring several times its former space to easily accommodate it, and which, not finding sufficient vent, seeks escape through the foramen, accompanied possibly by portions of other elements of the decayed pulp, poisoning the tissues about the end of the root, and leading to congested thickening of the immediate alveolar surroundings, forming a sort of tumor. This will generally, unless the gas be allowed to escape, increase, and ultimately break down by decomposition in its central portion, forming pus, evolving more gas, followed by increase of diseased territory and destruction of alveolar tissue, leading to a condition not identical with, but analogous to, that which exists in whitlow, with pus between it and its osseous attachments. The addition of exudation forces the pericementum more and more from the cementum, causing, at the same time, destruction of the alveolar walls around the sac, until, generally, if not opened early by artificial means, it finds vent somewhere by nature's own process. The pus, in such cases, extends along the line of least resistance until it breaks through one of the plates of the process, generally in the immediate vicinity; but it may extend along between these tables to a considerable distance before final escape. Sometimes this opening occurs in the posterior part of the mouth, or into and perhaps through the cheek or chin, or possibly it may burrow along between the muscles, and finally open under the jaw or in the neck, generally on the same side, but sometimes on the opposite side, causing intense pain, sometimes even jeopardizing life. Sometimes the discharge is into the antral chamber, frequently with an outlet through the nares.

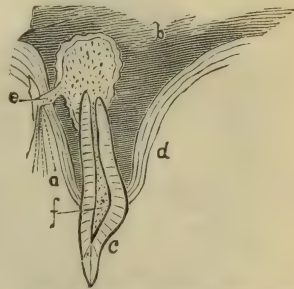


FIG. 1.—Section showing an abscess on a superior central incisor tooth.

The cavity thus formed in the alveolar process is lined with thickened and diseased periosteal tissue, with inflammatory deposits forming a cyst. This sac is lined with what the old writers called the pyogenic membrane, but which is, in fact, a pathological surface, within which there is pus detritus, and more or less of the dead portion of the root.

As stated, the basis-structure of the walls of the sac generally has

its origin more or less in pericemental tissue, which goes on increasing in thickness by the ordinary process of inflammation, and by

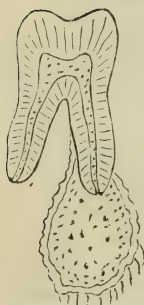


FIG. 2.—Outlines of an abscess on a molar tooth.

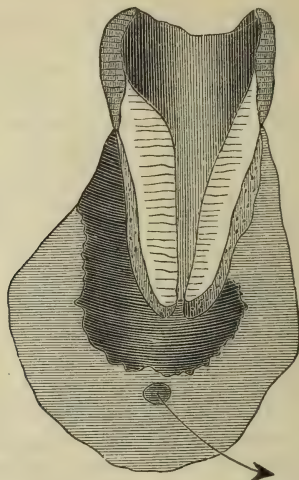


FIG. 3.—Section of lower jaw, showing the effect of an abscess on the twelfth-year molar.*

exudation, ultimately becoming more or less organized within and among this fibrous tissue.



FIG. 4.—External view of an abscess in the author's collection.

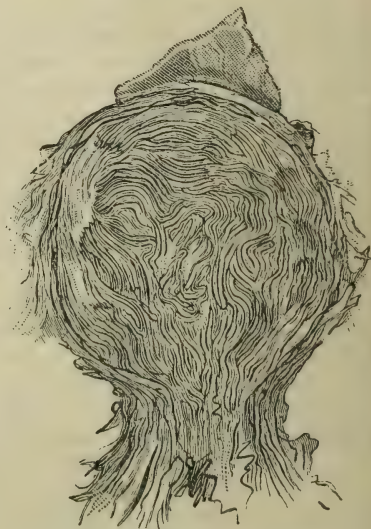


FIG. 5.—Section of the same abscess cut through the center, showing the appearance of one of slow growth.

But while the sac is in most cases primarily formed from the pericementum forced from the root, it is not always simply the lifting

of this membrane bodily from the cementum, for sometimes a considerable portion of it remains upon the root, while only shreds of it are traceable in the sac.

Alveolar abscess tends, through the heated pus detritus, to cause decomposition of the dead portion of the root; also, through some chemico-vital process along the territorial line between the living and the dead, to form irregular pockets in the cementum, sometimes penetrating even through it into the dentine, and causing total destruction of the corresponding extremity of the root, leaving it so ragged as to render a permanent cure impossible unless the root be first rounded off by some artificial means.

That which takes place in the cementum, along the quasi-vital line, may also be carried on to a more extensive degree in the adjacent alveolar process.

Alveolar abscess is thus found in all stages of development, and requiring considerable discretion in its management. The treatment will depend upon the duration of the disease, the age and health of the patient, and the condition of the tooth, pericementum, and socket, but especially on the stage or degree of degeneracy of the dead portion of the root. Very recent cases may possibly, I believe, when early and properly treated, be followed in some instances by a reunion of the pericementum. If this be true, the importance of early and radical treatment is apparent.

If the apex of a root be dead, this portion of the tooth must be considered somewhat in the light of a foreign substance. Notwithstanding that in most cases, by disinfecting the root, the progress of the disease may be permanently arrested, in other cases the dead apices of such roots are liable, sooner or later, even after the most skillful management, to undergo decomposition, causing re-formation of the abscess; especially is this liable to occur during attacks of sickness, as in the case of an encysted bullet, which during some decline in health may cause the reopening of an old wound that had been healed a long time.

It was only last week that I was called to the bedside of a young lady supposed to be dying from measles. The opening of an alveolar abscess which had formed during her sickness caused immediate and rapid improvement. Much might be said upon the importance of timely and radical treatment of such dental troubles during periods of sickness, for the timely treatment of alveolar abscess, like lancing the gums of children, will sometimes save life by removing the weight, which, added to other diseases, would result in death.

In the treatment of these abscesses our object should be to arrest the decomposition of living tissue and the evolution of gas, in order

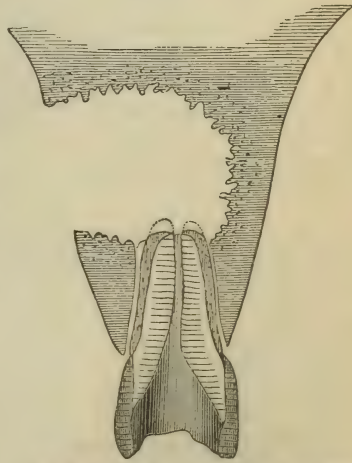


FIG. 6.—Section of tooth and alveolar process, showing the results of an alveolar abscess in an upper bicuspid tooth. From a specimen in the author's collection.*

to prevent pain and greater destruction of tissue. A remedy, therefore, which will arrest this degenerative process, and at the same time stimulate the adjacent living tissues to a healthier tone, is indicated. Of all the medicines now known for simple abscesses, especially chronic cases (unaccompanied with necrosis), it seems to me that creasote is equal to any, if it is not the best, because it has all of the desired antiseptic and stimulating virtues in a high degree. But although this is my favorite drug in ordinary cases, there are abscesses of larger size, especially those accompanied with necrotic conditions, which would improve better under chloride of zinc, aromatic sulphuric acid, etc. In my opinion, contrary to some authorities, we should not aim to destroy the sac, but to restore it to its former condition and position as nearly as possible. Our treatment should have in view, so to speak, the establishment of a sort of "line of demarkation" in the cystic tissues, by the stimulation of all the cells or tissue elements of the sac and surroundings that are capable of restoration to a higher degree of vitality, and the getting rid of those that are worthless. We should also endeavor to establish better circulation, thereby stimulating nutrition of the part. There are two methods of application of remedies: First, through the pulp-canal of the tooth; second, by treating directly through the gum and alveolar process. There is still another form of treatment, followed

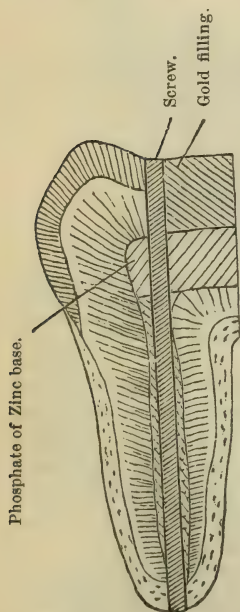


FIG. 7.—Section of a half-molar, showing how a large foramen may be safely filled with a gold screw.*

by a few operators, which is to pass through the alveolar process a bur drill of considerable size and cut away all the diseased territory, sac and bone, on the ground that there is always a necrotic condition of the process,—a condition which in fact is not often present. This method of treatment is old and heroic enough for anybody, but it does not appear to me rational unless there is actual necrosis, and even then it is doubtful if it be the best plan.

Having made the diagnosis, our first object should be to devise the best means of reaching the seat of the disease. To explain my views upon this is my present object.

Rational, radical treatment of disease, as I understand it, consists in the use of the right medicine in the right place at the right time, administered or applied in the right way and in the most direct manner.

When located about the front teeth, especially if there be a fistulous opening, the abscess may generally be easily reached and successfully treated by the old method of pumping the medicine through the pulp-canal with a swab on a small instrument;

but abscesses located about the roots of bicuspid and molar teeth, although they may be treated, and sometimes successfully, by the uncertain method of root dressing, cannot as a rule be radically treated except the medicine be applied more directly and through

the gum by means of some instrument of the nature of a syringe. One that can be operated with safety and with comfort to the patient is preferable. Such an instrument I show you here.* Until I de-



FIG. 9.—Hand right-angle drill stock, used in drilling into abscesses on posterior molars.

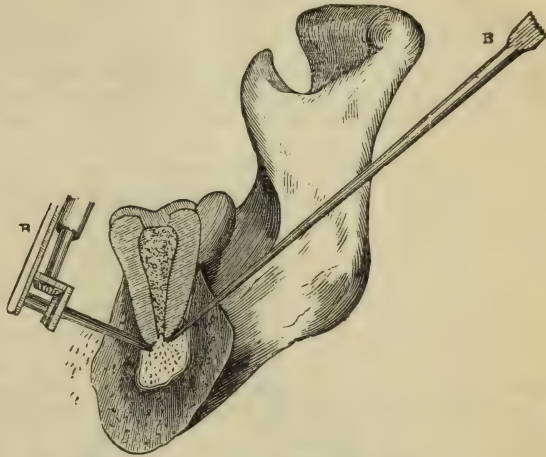


FIG. 8.—Section of lower jaw, showing abscess on a second molar tooth, and the method of producing an artificial fistula.*

vised this there were none practically painless, because the working of the piston saturated with creasote was so difficult that it could not be manipulated with sufficient care.

If it be difficult to treat abscesses already having fistulas, how much more so it must be to get medicine into them through the pulp-canal when there is no fistula! It is, indeed, almost impossible, unless the foramen be first enlarged, and even if made larger it would be like trying to pour liquid into a bottle already filled. Besides this it would be extremely difficult to properly drain the diseased part without leaving the tooth open, which would be liable to soon fill with food, and above all render the pulp-canal difficult to fill after a cure, without getting some of the filling pushed through the foramen into the seat of the abscess, thus causing more trouble and the probable loss of the tooth.

After a drainage through the alveolar process has been accomplished, either by nature or by some artificial means, the preparatory step in the treatment of this disease is to remove the cause of the abscess by thoroughly cleansing and disinfecting the interior of the pulpless tooth, after which it may be temporarily closed to prevent ingress of food, but more especially to compel any discharge to escape through the fistula, thus assisting in keeping it open until the disease shall heal

* The ordinary Farrar syringe, as shown in the advertising pages of the DENTAL COSMOS.

from the bottom first. Should the route of the fistula be tortuous, it is generally best to make a new and direct passage through the gum to the opening in the alveolus.

This accomplished, the treatment is at once made simple, and generally effectual, by the use of a syringe. To those who may urge that such treatment may be too painful I will say that, in this business, bold yet careful operators, who have a thorough knowledge of the anatomy of the parts, are generally more successful than timid

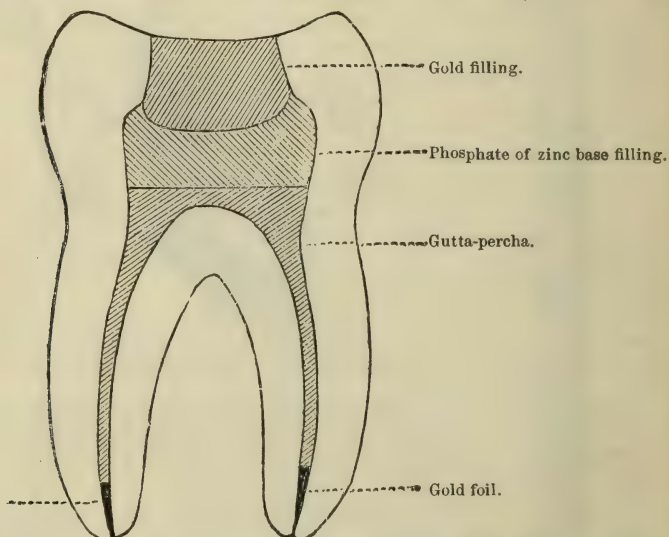


FIG. 10.—Section of molar tooth, showing how ordinary "abscessed roots" should be filled.*

ones; and even if considerable pain be caused at the first operation (though it is not often necessary), there is seldom much in subsequent ones if done properly.

Incompatibility in the use of drugs should of course be avoided. For instance, creasote, not readily uniting with water, might not, if mixed with previous water injections, be as beneficial as desired. I have known globules of wood creasote, under such circumstances, to gravitate and act only on the lower portion of a large abscess. While all this is true, however, there need be no difficulty if the creasote be first mixed with alcohol, with which it readily unites.

Any dilution of creasote may in this way be made to suit the individual case. Chronic abscesses demand stronger solutions; more recent ones often act more favorably under weaker solutions.

As a rule, one injection is not sufficient to effect a cure. It should be repeated once in three or five days until cured. Although the common practice of plugging the foramen at the apex of the pulp-canal with a small amount of creasoted cotton may be practicable, when free from association with abscesses (or even after the abscess is cured), I think there is less danger of future trouble from absorption of impurities if the extreme apical portion of the canal be

* For the cuts marked with asterisks we are indebted to the kindness of Dr. C. W. Spaulding, editor of the *Missouri Dental Journal*.

plugged with gold, filling the remainder of the canal with gutta-percha to cut off sudden thermal changes.—*Abstract of paper read before the Medical Society of the County of Kings (New York) by J. N. Farrar, M.D., D.D.S.*

THE SURGICAL TREATMENT OF FACIAL NEURALGIA.—The surgical treatment of cases of facial neuralgia of obstinate character, especially those operations consisting of the division of the trunks of the nerves involved, or the excision of a greater or less portion of their continuity, is now recognized as proper and legitimate.

Since the first introduction of neurotomy and neurectomy the subject has undergone several remarkable changes in the professional mind, the good effects of operative procedures being at times greatly exaggerated and their practice strongly recommended, and later the most vigorous condemnation having followed their performance.

As is usual where theories and views diametrically opposed to each other are held by men of equal repute and learning, the truth lies here midway between.

In the times of Albin and Marechals, when the practice of cutting all nerves supplied to affected parts without regard to their function was held to be necessary, many needless operations were done, and much damage inflicted. This soon led to a reaction which resulted in an entire rejection of all operative measures for the relief of facial neuralgia.

In a few years Haighton's numerous and favorable experiences led to another exaggerated extension of operative interference; the teachings of physiology were here also disregarded, and it was not until the powerful voices of Sir Charles Bell, Dieffenbach, and Romberg were raised in opposition to it that it fell into comparative disuse. These great men, however, offered little in the way of ameliorating the dreadful sufferings incidental to neuralgia of the nerves of the face, and there has again risen to the surface the practice of dividing and resecting the nerves involved. An increasing number of surgeons are actively engaged in the scientific and technical perfection of these operations, notwithstanding there were, until quite recently, eminent men—notably Stromeyer and Weber—who, in their special treatises upon the subject, declared these operations to be inadmissible.

It is to be feared that the judgment pronounced against these measures by so weighty and powerful an authority as Stromeyer may lead to a total neglect of the operations, and it may therefore not be deemed inadmissible to offer a few observations upon the value of surgical interference in this class of cases, hoping to be able to show that, within certain limits, it is good practice.

In the present state of our knowledge the surgical treatment of facial neuralgia may be limited to five different operative procedures, viz., neurotomy, neurectomy, neurectomy with removal of ganglia, arrest of arterial blood-supply, and nerve-stretching. Of these I propose to dwell upon neurotomy and neurectomy.

In neurotomy, as well as in neurectomy, upon nerves distributed to the face, the operation is clearly indicated in cases of peripheral neuralgia of purely sensory nerves. If performed upon mixed nerves, the resulting paralysis is such as to lead to considerable deformity and slow recovery; in fact, in a certain proportion of cases, the motor power of the facial muscles is never restored.

In view of the impossibility in many cases of locating the precise seat of the neuralgia, and likewise of determining whether it is of central or peripheral origin, it is justifiable to divide the nerve or resect a portion of its trunk at as high a point as it is possible to reach.

When we bear in mind that in the vast majority of instances the pain returns when the divided ends of the nerve become reunited after a simple neurotomy, we would hope to benefit our patients more by performing neurectomy in preference to neurotomy, when the former is at all admissible.

The rule is ordinarily laid down that these operations are only applicable to neuralgias of peripheral origin; that when the origin of the disease is central, no benefit can be derived from a division or resection of the trunks of the nerves leading to the periphery. Some very brilliant results obtained by Wagner, Nüssbaum, and Nélaton strengthen the opinion that even many of these otherwise hopeless cases may be benefited by the resources of modern surgery.

It is difficult to understand how these cases of central neuralgia are benefited by neurotomy or neurectomy. Probably the explanation offered by Erb is the correct one, viz., "that in neuralgia of central origin the several attacks are induced by the application of slight sensory stimuli to the periphery." After section of the peripheral nerves these stimuli are no longer conducted centripetally, and the immediate causes of the paroxysm are removed. If in this manner the operation only interrupts the painful excitation of the unhealthy nerve-center which follows peripheral irritation, and a regeneration of the nerve-tissue leads to a repetition of the paroxysm, still it is to be contended that the patient is entitled to the respite which may thus be gained.

In addition to this, Wagner advances the opinion that, the excitability of the nerve-tracts and central apparatus being suspended by the interruption in the centripetal current of peripheral irritation, sufficient time is gained for the removal of the original source of the peripheral irritation, if any exists, as well as for the quieting of the central excitability. The quieting of the central excitability by the interruption of the current proceeding from a peripheral irritation would have the effect of relieving the irradiated sensations of pain in other nerve-branches.

It is occasionally noticed that after the operation of neurectomy the pain ceases for the first few hours, afterwards returning with all its original intensity. This is undoubtedly due to the swelling about the stump of the nerve.

The organic changes which occur after the operation of neurotomy and neurectomy are of some moment. The traumatic irritation of the proximal end resulting from the exposing and cutting through of the nerve is of short duration, usually subsiding before the patient is fully recovered from the anæsthetic. It is not uncommonly observed that pain of severe character referred to the peripheral extremity of the nerve-tract follows immediately after the operation, passing over in a few hours, and, in very exceptional cases, days. Occasionally paroxysms of pain, exactly simulating those for the relief of which the operation was performed, occur after two or three days, and both patient and surgeon are likely to be deceived and discouraged thereby. They are, however, eccentric symptoms of a sec-

ondary traumatic irritation resulting from the pressure of inflammatory products, effused blood, pent-up pus, etc., always disappearing upon a removal of the cause, and with a decrease of the inflammatory reaction.

Another condition which may give rise to a return of the pain, independently of the condition which originally produced the neuralgia, is the compression of the swollen wounded end of the resected nerve in its bony canal. The wounded swollen end of the resected nerve is composed principally of young connective tissue, through which course small nerve-filaments. After a period of time has elapsed, we may confidently look for an atrophy of the stump of the nerve, due to the shrinking or contracting process which all regenerated connective tissue undergoes. Should the pain persist and be suspected to be due to this cause, a further operative procedure, consisting of a breaking down of the bony canal, would in all probability be effectual.

Again, there will occur cases in which a return of the pain is due to the fact that the nerve-stump has become intimately incorporated with the cicatricial tissue-formation in the process of healing. Here the contraction of the new connective tissue is a very decided disadvantage, and to it may be traceable the recurrence of the neuralgia. In these cases the paroxysms of pain occasionally cease when pressure with the finger is made upon the cicatrix, and return when the pressure is removed. There is no doubt that this is frequently the cause of a recurrence when the pain returns, after being absent, in a few weeks, in these instances it being supposed that the divided extremities of the nerve have in the case of a neurotomy become reunited directly, or, in the case of a neurectomy, by the interposition of nerve-filaments developed in the cicatrix; whereas it is really a case of simple peripheral irritation, due to mechanical causes. The proper resource here is a total extirpation of the cicatrix and primary union of the wound; this, in a majority of cases, leads to a permanent cure.

In order to avoid the last-named source of a return of the neuralgia as much as possible, it is desirable to obtain union by first intention of all divided parts involved in either neurotomy or neurectomy.

The limited number of pathological changes present and recognized in connection with neuralgia of the facial nerves leaves hope that there will yet be discovered more palpable alterations in the structure of these nerves, and upon the knowledge thus gained a more rational treatment than can now be offered be based.

When we contemplate the dreadful sufferings with which we have to deal,—how inexpressible the torture, and how discouraging the prospect of relief from the mere administration of drugs in persistent neuralgia,—I think that we will fall far short of our duty if we refuse the patient the benefit of any operative measure the performance of which holds out any hope of immunity from suffering. Few, it is to be hoped, will agree with Stromeyer that a freedom from pain for fourteen months is immaterial, and not to be taken into account in forming our judgment as to the propriety of operating.

Many surgeons of the present day will agree, I think, that these operations are not of less value than those performed for the extirpation of painful malignant growths which are likely to recur. These

latter operations are but palliative, and are performed by the surgeon with the understanding that a lasting cure is not to be hoped for therefrom. In the case of neurotomy and neurectomy, on the contrary, there is an almost absolute certainty of immediate relief, the operations themselves are far less dangerous to life, and, as the following statistics will show, hold out a reasonable hope of cure.

Wagner has collected one hundred and thirty-five cases of neurectomy, eighteen of which were performed by himself. Of these one hundred and thirty-five cases, in nine the results were purely negative. In six cases a fatal result followed. In one case the pain reappeared immediately after the operation. After a period of several months, the pain had returned in thirty-two cases. In twenty-five cases the patients remained free from pain for three years, the pain then returning. In eighteen cases the patients remained under observation less than a year, and no return of the pain had then taken place. In twenty-five cases, the patients being under observation for periods longer than three years, no recurrence of the neuralgia took place. In twenty-four cases the results remained uncertain.

Neuralgia of the Inferior Dental Nerve.—Formerly the only operation performed for the relief of neuralgia of this nerve consisted of division of the different branches of the nerve after it emerged from the foramen.

John Mason Warren, of Boston, was one of the earliest pioneers in the operative treatment of neuralgia of this branch. His plan was to trephine the inferior dental canal in one or more places, and remove as much of the nerve as possible through the openings thus made.

J. Kühn was the first to attempt to reach the nerve in its position posterior to the inferior maxillary bone, and before it enters the inferior dental canal. His object was to create the space necessary for operating by removing a triangular shaped portion of the angle of the jaw. His operation, as modified by Von Bruns, is as follows: A curvilinear incision is made, commencing at the interspace between the lobe of the ear and the posterior margin of the ramus of the jaw. This incision is carried around the angle of the jaw and anteriorly to the point where the facial artery crosses the bone at the anterior inferior angle of the masseter muscle. The parotid gland is carefully exposed, and the dissection carried sufficiently far to divide its anterior surface. The gland is to be carefully detached and turned back upon itself, and held there by an assistant during the remainder of the operation. The small branches of the facial or seventh nerve, which pass out from under the anterior inferior surface of the gland, are necessarily divided to a greater or less extent. The resulting paralysis of some of the muscles of expression of the affected side is unavoidable, but not always permanent, this latter statement being particularly true of the orbicular muscles.

Beginning at the angle of the jaw, the tissues underlying and situated posterior to the same are to be separated from the bone to an extent necessary to allow the free working of a small metacarpal saw. The bone being cleared, the saw is applied to the ramus of the jaw just above the angle, and the bone severed in about one-half of its width. The saw is now to be applied to the body of the bone just in front of the angle, and by sawing directly upward a rhombic piece

of bone is excised, a few touches of the knife serving to free it from the attached fibers of the internal pterygoid muscle. After the removal of the piece of bone, the nerve will be found in the angle formed by the junction of the two cut surfaces of bone, just where it enters the inferior dental canal; it can easily be separated at this point from the neighboring parts, to which it is but loosely attached, and its trunk excised to the extent desired. The inferior dental artery is likely to be divided in this operation; ligating it will at once arrest the hemorrhage.

There have been devised some very ingenious and bold operations for the relief of other neuralgias in the region of the third branch of the trigeminus, but the mutilation of the parts is so great, and the difficulties in the way of reaching the nerve beyond the point reached by Kühn's operation so many, that surgeons have very generally abandoned them.

Simple division of the nerve may be made at a point just previous to its entrance into the inferior dental canal, without external incision, as follows: Sufficient room being obtained by widely opening the mouth and having the cheek retracted by an assistant, an incision is made from the last upper molar obliquely outward and downward along the anterior border of the coronoid process and ramus of the jaw. After dividing a few of the anterior fibers of the internal pterygoid muscle, the surgeon with his finger tears through the connective tissue and feels for the bony prominence which marks the orifice of the inferior dental canal; this being found, a blunt hook is passed to the bottom of the incision, and, using the finger as a guide, the hook is swept around the nerve, isolating if possible the artery. A pair of scissors, or probe-pointed bistoury, is passed along the hook and the nerve divided. Should the inferior dental artery be wounded (and it is almost impossible to avoid this accident), troublesome, and even almost uncontrollable, hemorrhage may ensue.

This operation, although much more simple in its execution than the preceding, is far less satisfactory in its results, inasmuch as the nerve is very likely to become reunited in a comparatively short space of time.—George R. Fowler, M.D., in *Annals of the Anatomical and Surgical Society*.

ON SYPHILITIC TEETH.—Dr. Quinet (*Bullet. de l'Académie royale de Méd. de Belgique*, t. xiii., 3rd ser., No. 1, 1879) throws doubt upon the connection traced some twenty years ago by Mr. Jonathan Hutchinson between a particular deformity of the teeth and inherited syphilis. Dr. Quinet somewhat minutely examines Mr. Hutchinson's paper, and succeeds in finding points which are certainly open to criticism, but they are matters which have, some of them, been touched upon by other writers, and the inaccuracies found do not at all invalidate the main proposition.

The objections urged by Dr. Quinet are, principally,—

(i.) That the temporary teeth are not affected, whereas he holds that they ought to be if the evil influence be hereditary.

(ii.) That the incisors and canines are alone affected, whereas the first molars also ought to be.

(iii.) That the affections described do not fall in with the stages of development in which the several teeth are at any particular period.

(iv.) That they have no special character, and do not differ from the result of other casual checks in development.

(v.) That in the Museum of Alfort is a skull of a cow, the teeth of which would, he thinks, be called syphilitic by Mr. Hutchinson.

(vi.) He gives cases of deformed teeth where no syphilis was traceable.

The first objection is hypothetical; it may be true that the syphilitic virus is at work early, and often leads to miscarriage; but it may none the less be true that it has less power to upset normal development in matters of detail at an early than at a later period.

The second objection is that Mr. Hutchinson has described the incisors and canines as alone affected, while the first permanent molars are really being calcified at the same date, and so ought not to escape. Had such been the case the objection would have been very cogent; but, as a matter of fact, at the time when Mr. Hutchinson's observations were published, comparatively little was known about the development of the teeth, and hence on this ground many flaws may be found in his paper,—notably his "circumferential groove" in the canine. But more recent workers in the field have corrected and supplemented his description, and Mr. Moon (*Trans. Odonto. Society*, May, 1877) has expressly pointed out that the first molar is deformed, and deformed in a way exactly analogous with the incisors and canines, of which more later on.

The third objection has already been alluded to: the "circumferential wear" of the canine is, of course, a blunder; and the stages to which calcification has advanced in the several teeth at the time of birth were not sufficiently a part of the ordinary knowledge of the day for Mr. Hutchinson to have taken note of them. As a matter of fact, later observers, with these developmental dates in view, have found the lesions to correspond with remarkable exactitude to what might have been expected *a priori*.

The fourth point urged is that other cachexiæ are as likely to deform the teeth as syphilis. Possibly, but granted that cachexiæ can deform teeth, syphilis has been the only known constant factor in the history of children with these peculiar teeth. Mr. Hutchinson long ago challenged his opponents to produce a single case of "syphilitic teeth" in which there was anything like proof that there had been no syphilitic antecedent, and not one has ever been produced.

Dr. Quinet cites some cases, but his figures, and a careful perusal of his descriptions, lead to the inference that the teeth were not such as we should class as "syphilitic" at all.

And this remark applies emphatically to the case of the cow triumphantly cited by Dr. Quinet as a crushing blow to Mr. Hutchinson's beliefs; the anterior face of the central incisor carries "une raie transversale profonde tout à fait horizontale," situated half-way up the crown of the tooth. It would be a very bad business if every one whose children presented one of these familiar checks of development in their incisors were to be convicted of syphilitic taint, but happily the idea of regarding such a lesion as syphilitic has never been entertained.

No author has described the essential nature of the syphilitic deformity so well as Mr. Moon in the paper above referred to, where he speaks of "their peculiar state being due to stunted development

of the first formed portion of dentine,—in other words, a dwarfing of the cusps; and that the single central notch on their (the incisors) cutting edge is due to a greater diminution in the size of the central lobe than in that of the lateral lobes."

Dr. Quinet seems to be unaware that Mr. Hutchinson has abandoned the idea that the effect is produced by the intervention of an attack of stomatitis (see the report of discussion following Mr. Moon's paper), and also seems to be unacquainted with the opinion, now largely accepted, as to the share taken by mercury in the deforming of the enamel, and the formation of craggy, honeycombed teeth.

As Mr. Moon pointed out, in the history of the discussion of this question, there is one notable difference between the advocates of the connection of deformed teeth with syphilis and their antagonists, namely, the manner of conducting the argument. The former show cases, models of mouths, and histories carefully recorded, these all tending to the confirmation of their conclusions. To this their antagonists oppose no cases carefully recorded, and no models, but only their own general adverse impressions. Nowhere was this more conspicuous than in a recent attack upon Mr. Hutchinson's views contained in the report of the debate of the Association of Surgeons practicing Dental Surgery, where his ideas were warmly contested by many speakers, without anything of importance being put on record.

So far, the case in favor of there being syphilitic teeth is a strong one, but short, as in the nature of things it must almost necessarily be, of absolute proof; while the case against them is no case at all, though this does not of course prove that a better plea against the theory might not be put forth hereafter.—*Charles S. Tomes, M.A., F.R.S., in Monthly Review of Dental Surgery.*

AFFECTION OF CRANIAL BONES IN CONGENITAL SYPHILIS.—Dr. Lees exhibited the recent calvaria of a child nine months old, showing the early condition of the cranial changes from congenital syphilis, which Professor Parrot had described to the society last session. There was increased vascularity and thickening of portions of the frontal and parietal bones, the original site of ossification being unaffected. The pericranium seemed normal, but the dura mater was firmly adherent over the thickened parts. The specimen also showed areas of cranio-tabes. The child had also a large liver and a large spleen, and, when three weeks old, had had a rash on the genitals. It was one of twins, the surviving child presenting similar conditions. The father was a soldier. There was no trace of rickets. He (the speaker) therefore considered the cranio-tabes, as well as the other conditions of the cranial bones, as probably due to congenital syphilis.—*Reports Pathological Society, in Medical Times and Gazette.*

LARVA IN A GUM-BOIL.—Dr. Alexander Ogston exhibited, on behalf of Mr. Craven of Thurso, a living larva of one of the *Elateridæ* about an inch in length, removed from a gum-boil. The larva was supposed to have found its way into the gum-boil through the antrum.—*British Medical Journal.*

HINTS AND QUERIES.

"He that questioneth much shall learn much."—BACON.

CORRESPONDENTS desiring a reply in this department are requested to make use of *distinctive signatures or initials*, and avoid the practice of signing their communications Reader, Subscriber, etc.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names. We cannot insert queries or replies except they are so accompanied. Names not necessarily for publication.

WILL some one please tell me the best remedy for soreness of the gums after extraction?—G. A. F.

I SHOULD be glad to have the experience of others with reference to the best time for the insertion of artificial teeth after extraction. What are the advantages and disadvantages of immediate replacement or of prolonged waiting—say six months or a year?—G. A. F.

SOME months ago I had occasion to use some chloride of lime, the box containing which was placed in the medicine closet. Soon after I noticed a white deposit resembling dust over the bottles in the closet. After wiping this away several times it still continued, and although the box containing the chloride of lime has been removed from the closet now over two months, this same deposit or film reoccurs, much to my annoyance. How can I get rid of it?—LIME.

REPLY TO I. T. E., who asks how to remove tin foil from inside rubber plates. A scratch-brush will remove the most of it; moisten what remains with nitromuriatic acid, and remove with a brush or a dull excavator, washing the plate with soap afterwards.—L. P.

REPLY TO I. T. E.—The easiest method of removing tin foil from the surface of a rubber or celluloid plate is to shake a drop of mercury from the holder on it, and rub it over the surface with finger or brush.—E. S.

I. T. E., in "Hints and Queries" for June, inquires the easiest method for removing tin foil from celluloid or rubber plates after vulcanizing. If he will coat the foil with soap before packing the case, he will find it can be removed without any difficulty.—C. L. CADWALLADER.

IN answer to I. T. E., I would say that my plan has been to apply a small amount of mercury (being careful not to let it come in contact with protruding pins, if there be any), when tin and all will come away in a mass, leaving the plate smooth and clean.—G. A. D.

REPLY TO W. H. I., who asks how to amalgamate the zines of his battery. Place the zines in a dilute solution of sulphuric acid, say one part of acid to six parts of water. Let them remain in the solution for five or ten minutes, then scrub them off (an old tooth-brush answers the purpose very well), wash them in clean water, shake a few drops of mercury from a holder on to the plate, and distribute it over the surfaces with the finger.—A. M.

REPLY TO W. H. I., who asks in JUNE DENTAL COSMOS for the readiest method for amalgamating battery zines. To one part sulphuric acid add four parts water; dip the zinc in the solution and keep it there a few seconds, until action begins, which is readily seen by small bubbles rising to the surface; then immediately dip the zinc in a pot of mercury, or rub mercury on it with a woolen rag, and afterwards set the zinc in cold water for a few minutes. The solution can be kept for weeks.—W. H. G.

IN the June DENTAL COSMOS, W. H. I. wants to know the best method of amalgamating battery zines. Give him the following: Get a glass dish large enough to set the zinc into; do not have it over one and a half or two inches in height; fill it partly with mercury, put it into the battery cup, and set the zines into the mercury. As soon as the battery begins to work the mercury will flow up over the zinc and amalgamate it in the most perfect manner; and, if care is taken not to let the mercury run out, the zinc will keep in good condition and require no more attention.—G. W. H.

ANSWER TO W. H. I., in the June number of the DENTAL COSMOS.—A most convenient method of amalgamating battery zines is by the use of Desaga's amalgamating fluid, which is made as follows: twelve parts of mercury are dissolved in a mixture of fifteen parts of nitric and forty-five parts hydrochloric acid, by the aid of heat. After the solution of the mercury is complete sixty parts more of hydrochloric acid are added. The zines can either be dipped in it or the solution can be rubbed on with a cloth or brush. This method has the advantages of making a uniform deposit of mercury on the zinc, and of using the minimum amount of mercury. No previous cleansing of the zinc is necessary.—E. C. KIRK, D.D.S.

ANSWER TO W. H. P., who wants to know how amalgam that has become hard can be used again. I have used it by melting it in a crucible, stirring well with a piece of wood while melting, and pouring it into ingot moulds, and when cold reducing it to filings, removing the steel from the file with a magnet. It is then ready for use. It usually requires a very small quantity of mercury to render it plastic. I greatly prefer a glass shaking-tube to any other method of mixing. After it has been well shaken with the requisite quantity of mercury it has the appearance of a moist powder, but it is readily compressed into a mass by using the cylinder moulds, which also makes it into a convenient form for use. In melting, avoid burning. In mixing, avoid hand-rubbing and washing.—A. H. B.

LET W. H. P. place his amalgam in a sand crucible, and melt it with a little borax as he would silver or gold in a coal-stove. Heat gently till the mercury is vaporized,—a half-hour will be sufficient; then turn it on a piece of sheet-iron and file it up for use.—B. F. W.

REPLY TO W. H. P., who asks how amalgam after it has once set can be softened so that it can be used again. Melt the hardened pellets in a crucible and pour into an ingot mould. Reduce with file, and then give it to some poor dentist who cannot afford to buy a good article.—M. H. L.

REPLY TO J. D. U., IN MARCH NUMBER.—The trouble you speak of is not the result of poisoning, as all the coloring-matter used in rubber is insoluble in the fluids of the mouth. There is not any foundation for the supposition that some mouths are poisoned by wearing a red rubber plate. But the inflammation is caused by the non-conducting properties of the rubber; insert a metallic plate, and the trouble is overcome.—E. H. A.

IN answer to I. D. A., who asks in regard to the effect of burnishing oxychloride fillings with hot talc ("Hints and Queries" for May), I would say my experience with it has led to the following conclusions: Provided the heat is not applied until the cement is well set, and it is kept perfectly dry until the operation is entirely complete, it seems to add somewhat to their durability, but not to any very marked degree. If the heat is applied too soon, the surface of

the filling is apt to scale off. I think the effect is partly due to the heat's hastening the chemical action to which the hardening of the cement is due, and partly to its being kept dry longer than it would be if the talc were not used. The only virtue I see in the talc, beyond its being simply a medium to convey heat to the filling, is its peculiar softness, which prevents the surface of the filling being rubbed up. I have used the hot-air syringe, a heated instrument held near the filling, and various substances to convey heat to the filling, and have found no difference in the result due to the manner or medium used to apply the heat. A steel burnisher will not answer, because it is roughened as soon as it comes in contact with the filling, and destroys the surface instead of polishing it; hence the use of agate burnishers, which are not affected by the acid of the cement.—W. H. T.

THE reasons why gold fillings tarnish given from time to time in the DENTAL COSMOS have not been satisfactory to me. I have believed, and do still, that the fault is in the dentist. In finishing a filling recently, I found it impossible to make it look bright, even though the dam had not been removed. It assumed the red and coppery color we see after wearing for a time. Upon examination I found I was using a burnisher that only a short time before had been used with amalgam. This was a reasonable explanation to me of the discoloration; and if it is not to others, let them use an amalgam burnisher, without cleansing, on a gold plug, and then polish it bright.—L. P.

REPAIRING BROKEN PLASTER CASTS.—My way of late is to dissolve small pieces of celluloid in ether. After letting it stand some time I separate the oily substance from the cellulose, and use the latter as a cement. This dries quickly, and will not dissolve in water when the heating and pressing of the flask is going on.—J. D. UNANGST.

SOAP AS A LUBRICANT IN THE MOUTH.—A little soap, rubbed on the gilling-twine, will be found quite as efficient as wax in assisting its passage between crowded teeth when adjusting the rubber dam, and much more cleanly. It is also an efficient lubricant to the separating file. Rubbing the back of emery-cloth strips or corundum tape with dry toilet soap enables them to pass freely between teeth so close together that otherwise they could not be used, and, while greatly reducing the friction, does not impair their usefulness.—C. L. CADWALLADER.

IN your report of the discussions of the New York Odontological Society, held March 16, 1880, reported on page 306, DENTAL COSMOS for June, Dr. N. W. Kingsley is reported as having said that one of the greatest disadvantages of rubber plates is "the impossibility, almost, in ordinary hands, of keeping rubber absolutely clean;" that out of a thousand sets that came into his hands after having been worn, but one was absolutely clean. He believes the absence of cleanliness to be the cause of the sore mouths we occasionally meet with.

Although the statement is rather broad, I believe it to be in the main correct, and I think I can point out the reason why: not one set in twenty is properly hardened in vulcanizing; consequently the polish wears off easily, and then to keep such a set clean is impossible. A set of teeth vulcanized at 320° for fifty-five minutes as recommended by the manufacturers is not fit to enter anybody's mouth. On the other hand, a set of teeth well hardened and highly polished can be kept clean as easily as a gold set, and far easier than celluloid.—J. GUTTMAN, *Great Falls, N. H.*

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No. 8

ORIGINAL COMMUNICATIONS.

THE MINUTE ANATOMY OF DENTINE AND ENAMEL.

BY FRANK ABBOTT, M.D.,

PROFESSOR OF OPERATIVE DENTISTRY AND DENTAL THERAPEUTICS IN THE NEW YORK COLLEGE OF DENTISTRY.

DR. C. F. W. BÖDECKER, in the DENTAL COSMOS, vol. xx., No. 11, *et seq.*, has published articles on the minute structure of dentine and enamel, the conclusions of which, to my knowledge at least, have not as yet been corroborated by other examiners. This author claims that the dentinal fibers, first described by Tomes, Sr., are formations of living matter, which, as they run through the dentinal canaliculi, send extremely minute conical offshoots toward the basis-substance of the dentine. The offshoots, he claims, are directed into minute branches of the main canaliculi, which are seen in the basis-substance in great numbers. Upon entering the basis-substance, however, the offshoot is lost to sight. The whole basis-substance is pierced by a light reticulum which is supposed to hold a reticulum of living matter, although the latter is not visible. In the enamel this author has discovered delicate fibers between the enamel-rods. These fibers hold essentially the same relation to the basis-substance of the enamel as the dentinal fibers do to the basis-substance of the dentine. The enamel-rods are pierced by a light, mainly rectangular, network, which is likewise supposed to hold a minute reticulum of living matter. Where the enamel-fibers are not visible, we see minute parallel thorns or prickles, traversing the light interstices between two neighboring enamel-rods.

While engaged in the study of the process of dissolution of temporary teeth, I availed myself of the method of examination of enamel as first described by Bödecker. Knowing from previous experience that it is impossible to soften enamel sufficiently to be able to cut it with a razor, I proceeded briefly as follows: a tooth just extracted,

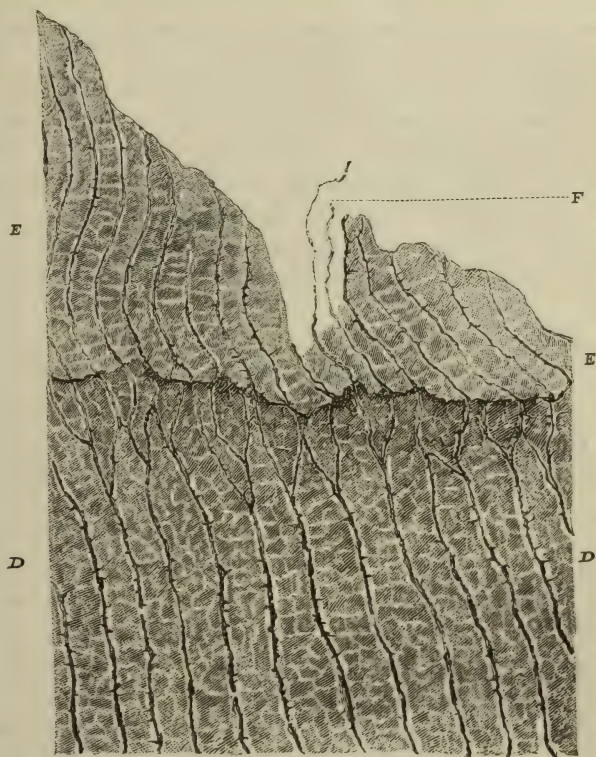
or kept not more than two or three days in a very weak solution of chromic acid, is ground thin on a corundum wheel, mounted on an ordinary laboratory lathe, and finished on a finer stone, to such a degree of transparency that it can readily be examined with the highest powers of the microscope even. The main precaution to be taken during the process of grinding is, that the tooth must be kept under water in order to prevent it from becoming dry. The specimen thus obtained is put into a very weak solution (one-fourth to one-eighth of one per cent.) of chromic acid for two or three hours, and then mounted in dilute glycerin. Specimens of deciduous teeth, if prepared in this manner, exhibit as the most striking feature a considerably smaller amount of basis-substance than adult teeth. As a consequence, the dentinal canaliculi are very much wider, and the dentinal fibers larger; thus the possibility of seeing the minutest relations between dentinal fibers and basis-substance is greatly facilitated.

I can add nothing to what Bödecker has described in minutest details in reference to the structure of dentine; I could easily see the dentinal fibers (which upon being stained with carmine assume a dark-red color) running through the canaliculi up to their bifurcations, close to the enamel; I could trace the lateral conical offshoots of the dentinal fibers to the point where they enter the basis-substance of the dentine. That the basis-substance holds a delicate reticulum of living matter I am perfectly satisfied, and I base my opinion upon my researches upon caries of the teeth, which I published in the DENTAL COSMOS, vol. xxi., February, March, and April, 1879, and upon my present investigations.

As to enamel, I have never seen the minute relations marked so plainly in permanent as I find them in the temporary teeth. Here the enamel-rods are narrower and the interstices between them wider, than in permanent or adult teeth. A power of five hundred diameters of the microscope (the most perfect lenses only are adapted for such examinations) is sufficient to show plainly, relations visible in permanent teeth with very much higher powers only.

The wood-cut is made from a drawing taken with a power of 1200 diameters (immersion), for the reason that otherwise it would have been impossible to have represented the minutest details of the structure of the specimen. In the dentine (D, D), the dentinal fibers, their lateral offshoots, and the light reticulum in the basis-substance are seen up to the boundary-line between dentine and enamel. In the enamel, the enamel-rods, the fibers in the interstices between the rods, the lateral offshoots of the fibers, and the light reticulum within the rods are represented. As a striking feature, I wish to emphasize the direct connection of the fibers of the dentine with those of the

enamel. Thus, the width of an enamel-rod is in full correspondence with the width of the fields of basis-substance of the dentine, after the bifurcation of the dentinal fibers, near the boundary between



dentine and enamel. In preparing this specimen, on several portions of the crown it happened that a larger portion of the enamel was ground away than was intended, so much so that only shreds of enamel in connection with the dentine were left. On one of these places delicate beaded fibers (F) were seen isolated on their upper ends, while their lower ends could be traced into interstices between the enamel-rods, and in connection with the ends of the dentinal fibers. No doubt here the mechanical injury done to the enamel has luckily led to a tearing out of a few enamel-fibers, which accident plainly illustrates their presence.

That enamel is not a crystal, but a tissue, alive so long as the pulp of the tooth is alive, no one, I think, will doubt who has studied caries and seen the pigmentation of enamel and its reaction during that process.

SOME METHODS FOR THE PERMANENT ATTACHMENT OF ARTIFICIAL TEETH TO NATURAL TEETH IN THE MOUTH.

BY WILBUR F. LITCH, M.D., D.D.S.,

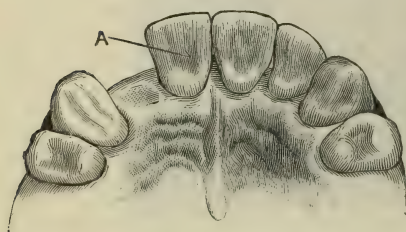
PROFESSOR OF MECHANICAL DENTISTRY, MATERIA MEDICA AND THERAPEUTICS, IN PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

THE recession of the soft tissues and of the alveolar process from around natural teeth, caused by the wearing of the usual forms of partial artificial dentures, as well as the chemical and mechanical erosion so frequently occasioned by the presence of metallic clasps when such appliances are used for the retention in place of artificial dentures, renders very desirable the employment, when possible, of less objectionable methods than those usually resorted to in partial cases.

When but a single front or lateral incisor tooth is missing, the following methods of permanent attachment to the adjoining natural teeth will be found to obviate the objections above referred to, to be simple in application and durable and satisfactory in the wearing.

Fig. 1 represents a typical case, in which an entire lateral incisor tooth, crown and root, has been lost, the canine and front incisor remaining in position.

FIG. 1.



For the permanent attachment to the natural canine and incisor of a porcelain substitute for the lost tooth two methods are to be described. The first is applicable only when the nerve-pulp of either the canine or incisor tooth is de-

vitalized. The second is applicable when both the canine and incisor teeth contain vital nerve-pulps.

In detail, the first method is as follows:

1st. Take a very accurate impression of the parts involved in the operation, namely, of the canine and incisor teeth with the gum margin of the interspace. From this impression take a plaster of Paris cast, and from the cast make a metallic die of zinc and counter-die of lead.

2d. From pure gold or platinum of the thickness of 24, Stubbs's standard gauge, swage base-plates to be accurately adjusted to the palatal and palato-approximal surfaces of the incisor and canine teeth.

3d. Fit into the interspace a plain plate porcelain lateral incisor tooth of the proper shade, selecting for the purpose a tooth slightly too wide for the space to be filled, so that it shall when fitted into

position rest upon and be supported by the labio-approximal margin of the canine and incisor respectively, even if to do this it be necessary to throw it a trifle outside the arch. The neck of the porcelain tooth should be very accurately adjusted to the gum and lightly rest upon it.

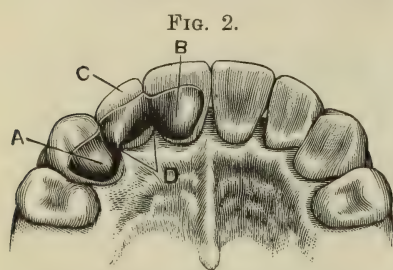
4th. With pure gold or platinum, of the thickness already indicated, make a backing for the porcelain tooth. When the interspace is too wide for a porcelain tooth of such a size as will harmonize with the remaining natural teeth, the pure gold backing may be folded over the approximal borders, and finished after the manner of approximal gold fillings, thus closing the interspace without presenting too broad a face of porcelain.

5th. Place both the tooth thus prepared and the base-plates already made upon the cast, and accurately adjust the approximal edges of the base-plates to the backing of the porcelain tooth, so that there shall be complete adaptation of all the parts to the positions they are respectively intended to occupy in the mouth, and also to each other.

6th. When this adaptation is obtained, cement together the base-plates and backing with a brittle resinous cement (resin, two parts; wax, one part; or sealing-wax will answer), and before the cement has fairly hardened remove from the cast to position in the mouth, and perfect the final adjustment there. By this method much greater accuracy of adjustment can be obtained, as the lines of length, width, and contour are too fine to be reproduced with absolute fidelity in a plaster model. In making this adjustment too much care cannot be taken to have each separate piece of the appliance fitted with absolute accuracy of adaptation to the surface upon which it is intended to rest. When this adjustment has been satisfactorily completed, throw upon the yet more or less plastic cement a stream of ice-cold water from an office syringe, to render the cement perfectly brittle and incapable of bending. This done, immediately remove from the mouth, and invest in a mixture of equal parts of marble-dust and plaster of Paris, or finely pulverized pumice-stone and plaster of Paris.

7th. After the investment has firmly set, solder the base-plates to the backing, and the backing to the platinum pins of the porcelain tooth, using as a solder either pure gold or gold coin if the base-plates have been made of platinum, or gold coin if they have been made of pure gold. Thus firmly joined the appliance will present the appearance indicated in Fig. 2. A, representing the base-plate for the canine tooth; B, the base-plate for the incisor tooth; C, the porcelain tooth with its platinum backing; D, the points of union between the base-plates and backing. At these points of union it is important that a large amount of soldering material should be placed, as at these

points the greatest amount of strength is required, and at these points thickness can usually be increased without interfering with occlusion in the act of mastication.

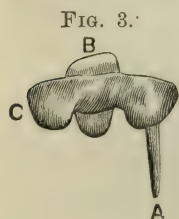


The appliance thus far completed will, when placed in position, be found self-supporting against all the forces employed in the act of mastication. Pressure upon the palatal border of the porcelain tooth or upon its cutting-edge is resisted by the base-plates; pressure upon its labial border is resisted by the

extreme edge of the labial border, or the labio-approximal border of the canine and incisor teeth against or upon which it rests. There is support upon every side against all forces except the force of gravity. To overcome the force of gravity and retain the entire appliance in position is the object of the attachment now to be described.

8th. Assuming the front incisor tooth to be devitalized, the pulp-canal is opened into from the palatal surface of the tooth (at A in Fig. 1), and, after proper antiseptic and other treatment, a platinum pivot is fitted to the caliber of the pulp-canal, the canal being slightly enlarged if too small to admit of a pivot of sufficient size and strength. In practice no very great thickness of pivot is required. A thickness of 16, Stubbs's gauge, at the point of its attachment to the incisor base-plate is sufficient. Above this point length is of more importance than thickness, and the remainder of the pivot may be made more and more tapering, corresponding to the usual shape of the pulp-canal.

9th. The platinum pivot having been fitted to the pulp-canal, an opening must be made in the incisor base-plate (at B in Fig. 2), through which the free end of the pivot may pass. Base-plate and pivot are then cemented together, adjusted in the mouth, withdrawn, invested and soldered as before. In this final soldering the entire palatal surface of the base-plates and backing, if made of platinum, may, if desired, be covered with a film of gold. After polishing, the appliance is ready to be placed in position in the mouth, and presents the appearance indicated in Fig. 3. A is the platinum pivot attached to the incisor base-plate; B, the porcelain tooth and backing; C, the canine base-plate.



10th. The method of attachment is that now usually adopted for the insertion of an ordinary pivot tooth, namely, by means of an

insoluble gutta-percha cement or packing. For this purpose the use of two grades of prepared gutta-percha is desirable. The first grade, known as "Prepared Gutta-Percha, No. 1," contains very little calcareous or siliceous material, and as a consequence is exceedingly adhesive, closely clinging to every dry surface with which it is brought in contact in the softened state. The second grade, known usually as "Hill's Stopping," contains a large calcareous or other foreign admixture, and is very slightly adhesive, but has great firmness and resisting power.

Having these two grades of gutta-percha in readiness, dry the artificial denture thoroughly, and also the natural teeth to which it is to be attached. To the surface of the pivot (previously somewhat roughened), and to the entire under surface of the base-plates, closely apply a coating of the adhesive gutta-percha; upon this surface place a film of Hill's stopping. Heat the entire appliance until the gutta-percha is thoroughly soft and plastic, and then press firmly into position in the mouth. The adhesive gutta-percha will be found to prevent the complete stripping of the packing or cement from the pivot as it is pressed into the pulp-canal.

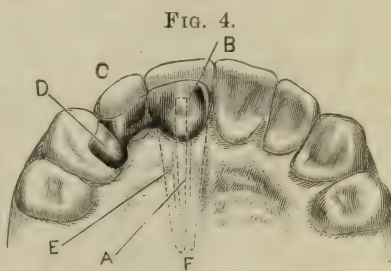
Remove the surplus gutta-percha which will have escaped from the free margins of the base-plates. After the packing has hardened, the artificial denture will be found firmly fixed in position. The gutta-percha beneath the base-plates will thoroughly protect from decay those surfaces of the teeth upon which they rest.

Fig. 4 represents the completed appliance in position. A is the pivot in position in the root; B, the incisor base-plate; C, the porcelain tooth and backing; D, the canine base-plate; E, gutta-percha packing; F, pulp foramen.

Ordinarily these base-plates, when not made to extend too far towards the cutting-edge, will be found to interfere but slightly with occlusion; such interference can readily and, relatively speaking, harmlessly be remedied by the removal of a small portion of the cutting-edge of such lower teeth as may be implicated.

In practice, where the pivotal attachment is made to the incisor tooth, the canine-tooth base-plate need not cover its entire palatal surface; a partial covering, as in Fig. 4, will be quite sufficient for strength and firmness. Conversely, this is true of the front incisor base-plate when the pivotal attachment is made to the canine tooth.

The prolongation of the pulp-canal, above the end of the pivot, up



to the point F in Fig. 4, should be packed with gutta-percha before finally introducing the denture, care being taken to have no excess of gutta-percha above the end of the pivot, as then the appliance cannot be pressed fully into position.

METHOD OF ATTACHMENT WHEN THE CANINE AND INCISOR TEETH CONTAIN VITAL PULPS.

1st. Construct the denture precisely as before, with the exception of the pivot attachment.

2d. For the purpose of attaching the denture thus constructed, drill a small and perfectly cylindrical opening through the center of the palatal surface of the enamel of both the canine and incisor teeth. These openings should then be slightly undercut. They must go no deeper than the enamel, as, if the dentine is encroached upon, there is danger of the exposure of the pulp. When the dentine remains undisturbed such exposure is impossible. In size these openings should not be larger than will admit a platinum rivet-head in diameter corresponding to 16, Stubbs's gauge, or about the diameter of the platinum pin-heads used in porcelain teeth. For each opening thus made in the enamel must be accurately fitted a platinum pin or rivet of the size indicated. The rivet-head must be exceedingly thin and perfectly flat, both upon its upper and under surface. The free end of each platinum rivet should be carefully split for almost its entire length, or very nearly up to the rivet-head itself. After such nearly complete splitting of the platinum rivet, press the two halves together again.

3d. In the center of each of the base-plates of the denture make an opening corresponding to the rivet-holes prepared in the natural teeth. These openings in the base-plates should be a hair's-breadth larger than the rivet-holes, and they should also be as much beveled or countersunk as the thickness of the plate will permit.

4th. As before, carefully dry the natural teeth involved in the operation, and also the artificial denture; apply the gutta-percha packing, heat, and press into position precisely as before.

5th. After the packing has thoroughly hardened, carefully remove the surplus gutta-percha which will have been pressed through the openings in the base-plates and into the rivet-holes in the natural teeth. Insert into each opening the platinum rivet prepared for it, and with exceedingly fine plugging instruments carefully pack gold foil around and upon the rivet-head. The undercut made in the rivet-hole will act as a retaining groove. When the gold-foil packing has reached the level of the surface of the natural tooth, press apart the two sides of the split platinum rivet, cut off the surplus portion of the free ends, and pack and weld adhesive gold in, around, and upon

the split rivet and the countersunk opening in the base-plate, thereby completing a perfect double-headed rivet of gold and platinum. As with the root pivot used in the first process, so with these rivets used in the second process, the only duty they are called upon to perform is to sustain the slight weight of the denture against the force of gravity. All other forces are met and resisted by the denture itself, independent of such attachments.

Figs. 5 and 6 represent this appliance in the detached form. A is the porcelain tooth and backing; B, the interspace it is designed to

FIG. 5.

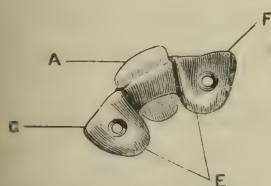
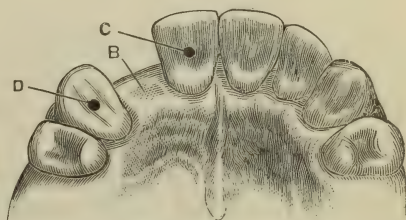


FIG. 6.



fill; C and D, the undercut rivet-holes in the natural teeth; E, the canine and incisor base-plates; F and G, the countersunk openings in the base-plates.

Completed, the appearance of the appliance is precisely the same as in Fig. 2.

Fig. 7 represents a longitudinal section of a tooth with a base-plate in position. A is the pulp-chamber; B, the dentine; C, the enamel

FIG. 7.

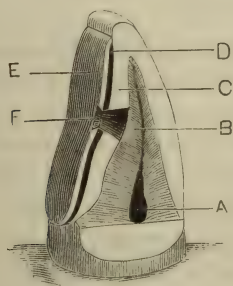
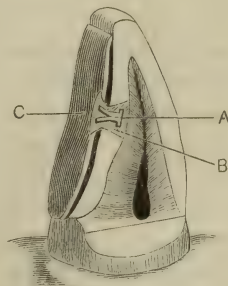


FIG. 8.



with the undercut opening for the admission of the platinum rivet; D, the gutta-percha packing; E, the platinum base-plate; F, the countersunk opening in the base-plate.

Fig. 8 represents the same longitudinal section with the double-headed rivet formed and in position. A is the inner head; B, the gold packing; C, the split platinum pin and gold packing forming the outer rivet-head.

Figs. 9 and 10 show how this method of attachment may be utilized for the insertion of porcelain tips for incisor teeth when that

FIG. 9.

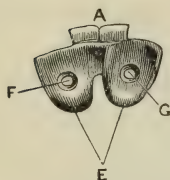
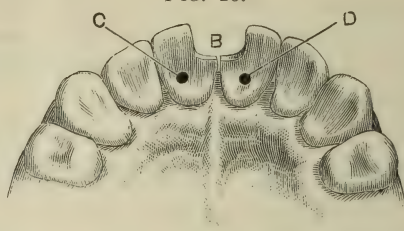


FIG. 10.



process is thought to be desirable. A represents the porcelain tips; B, the space to be filled by them; C and D, the rivet-holes in the incisors; E, the base-plates for the incisors; F and G, the countersunk openings in the base-plates.

Each porcelain tip contains one or two platinum pins, by means of which it is soldered to the base-plates in the usual manner. This appliance must be packed with gutta-percha, pressed into position, and held by double-headed rivets formed and placed as before described.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to Act of Congress, in the year 1873, by J. Foster Flagg, D.D.S., in the office of the Librarian of Congress at Washington.]

(Continued from page 343.)

If by the beginning of the following week a gradual soreness of the tooth is becoming apparent, a *systematic frequent stopping and unstopping* of the tooth must be instituted. No canal-dressings should be introduced, but glycerin and oil of cloves, glycerin and aconite, glycerin and chloroform, or aconite and chloroform, in regular gradation, according to the urgency of requirement, should be placed in the pulp-cavity, worked into the canals (gently), and secured by a cotton pellet moistened with cloves. This should be removed in from six to eight hours; a second stopping of the same kind should then be allowed to remain about fifteen hours; a third stopping, twenty-four hours; a fourth stopping, forty-eight hours; a fifth stopping would thus be introduced on Friday morning, if the first was introduced on Monday morning.

The fifth stopping would then have seventy-two to seventy-five hours to remain until the *following Monday morning*; at this time, if no soreness existed,—and it would be an extraordinary case indeed if

soreness had been induced,—*the attempt should be made to dress the canal.*

This is truly a delicate operation. The canal should first be filled with glycerin; should there be any surplus in the bulbous portion of the pulp-cavity, it should be removed with bibulous paper; the introduction of the canal medicament would, by this time, have become a matter of reasonable facility, but now, *in addition to this*, there should be introduced a taper-twisted canal-dressing of cotton-wool dipped in dental aconite or oil of cloves.

The passing of this cotton into the canal, *as it should be done*, is certainly an operation requiring exceeding dexterity. The cotton having been twisted with a true and delicate taper, should have its filament point cut off, that the one extending fiber may not catch upon the edge or side of the entrance and thus interfere with accurate insertion; the pointed end of the fine probe is better, also, if a tiny portion of it is cut off by the scissors, as this leaves an end which more securely takes hold of the cotton dressing.

After having taken the taper twist by the *larger end* with the thumb-pliers, the smaller end should be dipped into the tincture of aconite or oil of cloves, and having been saturated for about half its length, should then be laid upon the edge of the mouth of the bottle containing the medicament.

The dressing should then be taken *by the smaller end*, which should be placed accurately in the cavity of decay or in convenient position across the orifice of entrance; the medicament will cause sufficient adhesion for support of dressing; a suitable-sized probe having been selected, it should then be used as a means for directing and introducing the dressing. This should be delicately taken upon the end of the probe and passed through the glycerin into the canal.

The art of doing this well *under ordinary circumstances* is attained with comparative facility and with a reasonable amount of practice; but, as I have intimated, *the introduction of dressings in cases of convalescence from "third grade" periodontitis is a matter of exceeding delicacy.*

The dressings should be passed slowly, carefully, accurately and, above all, *gently*; the packing should be easy; no attempt at *compact-ing* should be made; the probe having carried the dressing as far as is practicable should be withdrawn *a trifle*,—only a very little,—and by this means having secured, upon its end, another portion of cotton, this should be passed into place.

It is by the repetition of this slight withdrawal and re-insertion of the probe that the dressing is nicely and evenly introduced.

I cannot too strongly insist upon the immediate withdrawal (*gently*) of the cotton, if the least sensation is produced by its in-

sersion. It is not needed that *pain* shall be a concomitant with the introduction of dressings in order that most unfortunate sequences should follow these attempts at closing the canals; neither is it any guarantee of immunity from suffering that the *slight sensation* which has been referred to passes almost immediately away.

The fact of *any sensation* having occurred is the warning note that harm has been done; that undue pressure has been made; that excessively susceptible tissue has been impinged upon; and the *best practice*, I think, is to quietly and promptly withdraw the irritant, allow a few minutes for the re-establishment of a comfortable condition, and then try again.

If, however, the introduction of the dressings has been successfully accomplished, one or more pellets of cotton—not too tightly rolled—should be placed as coverings for them, and as preventives to the lodgment of *débris* in the cavity of entrance. These pellets may, or may not, be moistened with sandarac varnish, according to the exigencies of the case. If it is not desirable that the stopping should be quite impervious, it is better that the pellets be merely dry cotton, not too tightly packed; if it be that the indications point to the probable permissibility of tight stopping of limited duration, it is more cleanly and more pleasant that the pellets be moistened with sandarac.

In these difficult cases the same *routine* of gradual increase of length of duration of closure should be followed as has been directed for the closing of the open canals; thus, it is by all means important that the dressings should be removed and the tooth left open for a few minutes—five, ten, or fifteen, according to the gravity of the case—on the afternoon of the day of stopping,—Monday,—even though there is not the slightest perceptible discomfort. I regard it as *essential* that saliva should not enter the tooth during these periods of opening for relief; this should be prevented by the use of a napkin and the maintenance of an open mouth.

After a second closing the patient should be directed to call as early as possible the next day *if there should be the least knowledge of the presence of the tooth*; but, if everything should remain perfectly quiet, permission may be given to call at any hour most convenient; instruction should, however, be given that a call *must be made* even though there may seem *now* to be no actual need for it.

It is at this point that I wish to impress most clearly the underlying principle which governs all this treatment of *pulpless teeth*.

I have given the comparatively simple method, which is all that is usually required, for the ordinary preparation of a pulpless tooth which has suffered from peridental irritation; it may, nevertheless, be observed that a governing principle controls this apparent simplicity

I have given the increased therapy which is needed by the somewhat more serious cases (pulpless), and it may still be noted that the same principle holds control.

This principle is the gradual but uninterrupted restoration to comparative normality of parts and organs which have been, and which are yet, in conditions of decided abnormality.

I have called attention to the "peridental membrane" as that tissue which, in its inflamed condition, is giving rise to *all the trouble*; as that tissue from whence the *pain* arises; from whence the *sense of elongation* of the tooth is given; from whence the *acute response to striking the tooth* proceeds. I have called it the "seat of war" that I might the more concentrate upon it the whole attention of the practitioner.

It must now be recognized that every mode of treatment, every operation, every medication in connection with *periodontitis*—no matter from what cause—has been directed *to the relief of this membrane*; but it must also be recognized that in cases of *periodontitis* in connection with teeth possessing living and more or less healthy pulps, the treatment which relieves the suffering *places the teeth and surrounding parts in a practically normal condition.*

On the contrary, the treatment which is necessitated *for the relief of this membrane*, in a case of *periodontitis* from putrescent pulp,—*pulpless tooth*,—when relief is given, and when everything is perfectly comfortable, *leaves both membrane and tooth in an eminently abnormal condition.*

The tooth, which in normality is possessed of a closed pulp-cavity and living pulp, is left with an open pulp-cavity and no pulp; the peridentium, which in normality is effectually protected from contact with external irritants,—other than those purely *mechanical*,—is left with a passage affording free ingress to all kinds of irritants, and is also left with an *egress* for its own fluids of effusion, which permits a perfect semblance of normality, so far as sensation is concerned, *even though dangerous abnormality is really existing.*

All this must be appreciated,—thoroughly appreciated,—and just in proportion as this is thoroughly appreciated, so will the "governing principle" of this "gradual restoration" be clearly understood, and hence may be intelligently modified to meet every possible phase of this intricate form of *periodontitis*.

It is, then, with an appreciation of this condition, that the first step toward *final treatment*—closing of the tooth preparatory to filling—consists in the removal of *débris* from pulp-cavity and canals.

It is recognized that this effort is attended with more or less irritation *to the peridental membrane*; that just in proportion as drilling, chiseling, excavating, probing, and syringing have to be indulged in,

there *must be* irritation in larger degree, and this, too, possibly without any indication of its existence.

It is at *this point* that the *difference in treatment, instituted by different practitioners, begins*; from this point onward a regular gradation of difference continues, and thus it is that a want of appreciation in regard to existing conditions permits an unhesitating stopping of canals with canal-dressings of cotton *saturated with creasote* (!); these are followed with pellets of cotton moistened with sandarac varnish, *packed tightly* into the pulp-cavity, and these are covered with a stopping of gutta-percha.

Having thus arranged things so that *a recurrence of peridental irritation is inevitable*, the patient is dismissed with directions to report in a few days, and it may be that an appointment for filling the tooth is made for "this day week."

The result of this "treatment" (?) is, that in about twelve or fifteen hours an *uneasiness* begins to develop,—the patient supposes it to be the natural sequence of dental manipulation and therefore endures; by the next day the uneasiness has increased to *soreness*, and a visit of inquiry is made. The patient is told that it will probably soon pass away, for "everything *looks* all right, and it is a very bad tooth." Next follows a sleepless night, and the next morning a visit is made with a *very painful* tooth, when the gutta-percha stopping, the sandarached pellets, and the creasoted cotton canal-dressings are all removed; after a while the tooth becomes easier, when it is *again stopped with a pellet of cotton dipped in creasote*, which the patient is *directed to remove* if the tooth again becomes troublesome.

The tooth *does* again become troublesome; the cotton is removed, the tooth becomes more and more comfortable until it is sufficiently recovered to permit a *repetition of the same treatment*, with a recurrence of the same results, when it is pronounced "beyond treatment" and is *extracted*. This is the history of hundreds of teeth.

A second grade of appreciation dictates the same kind of stopping for the tooth, with, perhaps, the substitution of an outside pellet of varnished or collodion cotton in place of the gutta-percha; but the *possibility* of irritation is recognized, and the patient is directed to return if there should be a recurrence of *soreness*. Thus it is that when the tooth becomes sore the dressings are removed, the tooth is left open for a day or two, the stopping is then renewed, and the soreness again supervenes; this alternation of stopping for a day or two and opening for a day or two is sometimes continued for weeks, and even for months, until both patient and operator become thoroughly disheartened, and then, with the conclusion that "both are entitled to great credit for endurance and perseverance," *extraction* is decided to be the last resort.

How different from all this is that better appreciation of the situation which recognizes as the result of the necessary stopping of the tooth the probability of an almost inevitable, though at first imperceptible, deviation from that quiet which is *known to be only an apparent cessation of hostilities*, and which, in this recognition, prepares for the struggle, watches the enemy, guards carefully against surprise, and in this manner gives comfort instead of affliction to the patient, and usually eventually saves the tooth!

And yet again how different, *even from this*, is that broadest appreciation which, taking cognizance of all the *temperamental attributes*; of the controlling influences which are exercised by the *age, sex, occupation, surroundings*, and *physical condition* of the patient; of the structure, location, anatomical conformation, and relative liability to disease of the tooth which is under treatment; of the resistive and recuperative power of the surrounding tissues; of the applicability of a given line of definite medication, both local and general: thus grasping the entirety, institutes a course of practice which results in almost universal success, even in the gravest cases, and which, from a truly professional stand-point, represents the highest type of *Therapeutic Dentistry*!

(To be continued.)

ESTHETIC DENTAL PROSTHESIS.

BY W. WARRINGTON EVANS, D.D.S., M.D., WASHINGTON, D. C.

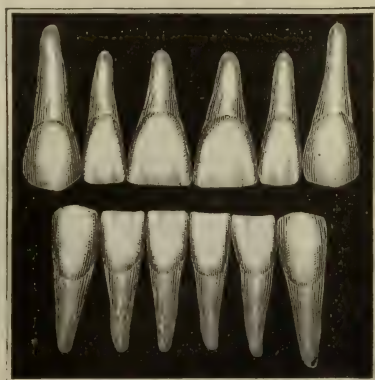
(Continued from page 348.)

THE modifications which can readily be made in the *expression* of a set of teeth by shading, by grinding, and in mounting will surprise

FIG. 8.



FIG. 9.



any one who has not given thought and experimented in this direction. Fig. 8 illustrates what I consider a beautiful set of continuous-

gum teeth, of what we may call the English type, but capable of wonderful modification when of different shades, and ground and mounted with reference to different age and other individual characteristics. The teeth are represented in the shape given to them by the mould. Fig. 9 shows the same teeth altered in expression by grinding the cutting-edges and squaring the mesial surfaces, which gives an appearance of age. This effect can be carried to a lesser or greater degree to suit the individual case.

FIG. 10.

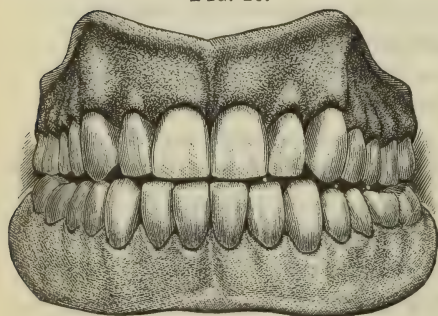


FIG. 11.

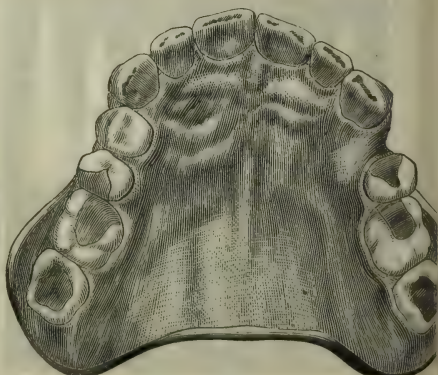


Fig. 10 is a mounted set from the same mould, and may represent a patient, say, of the Anglo-Saxon type, twenty-five years of age,—a broad, full, well-developed mouth; clear-cut, well-formed teeth, with no blemishes of imperfect enamel. In this set we have retained as near as possible the natural formation of the teeth as they come from the mould, to show a young mouth, and to make the variations in the cases which are to follow more distinctive. The superior centrals are thrown out slightly by the underlapping of the laterals. A slight irregularity of the four inferior front teeth has been made,

FIG. 12.



FIG. 13.



merely to avoid conventional uniformity and to disarm suspicion of artificiality. The jaws are shown a little apart in order to display

the cutting-edges more clearly. Figs. 11, 12, 13, 14, and 15 are of two cases kindly loaned to me by Dr. J. W. White. They represent teeth from the same mould as those of Fig. 8, and enable me to carry out this series. These cases show the wide range which this one set of teeth is capable of being made to cover. Fig. 11 may illustrate the mouth of an old gentleman, robust and vigorous; florid face, and evidently fond of good living. The shading of this set of teeth for such a case is perfect; the abrasion is well marked, and the irregularity of the lower incisors exceedingly natural. Fig. 12, a side view of the same case, shows the irregularity even better than the front view. The loss of the left superior first bicuspid, creating the gap so frequently seen at this point in natural dentures, gives greater prominence to the cuspid, making it seem more indicative than before of strong animal passions. Fig. 13 is a palatal view of the same case.

FIG. 14.

FIG. 15.



Fig. 14 shows the mouth of an individual past middle life, and the recession of the gums so often seen nowadays. The effect produced by the abrasion of the lower incisors and the separation of the centrals is exceedingly life-like, and well calculated to convey the impression of original ownership. Fig. 15 is a side view of the same case.

No one who will take the trouble to compare, or rather to contrast, Figs. 10, 11, and 14, remembering that these three sets of teeth, so radically different from one another, were made from teeth out of the same mould, can fail to be impressed with the thought that the blame for the "picket-fence" conventional dentures generally seen in the mouths of their wearers is not to be laid at the door of the manufacturer, but is to be attributed rather to the want of artistic taste in the routinists who mount them.

(To be continued.)

NEW METHOD OF SUBSTITUTING AN ALL-PORCELAIN CROWN UPON ANY ROOT IN EITHER DENTURE.

BY W. G. A. BONWILL, D.D.S., PHILADELPHIA, PA.

No argument is needed to convince the advanced practitioner that some method is demanded whereby the thousands of good roots now sacrificed can be made permanently useful. Notwithstanding the great revolution wrought by machinery and improved appliances for filling teeth, so few are the successes that, unless some plan is brought to our aid to save the remaining roots from the ravages of decay, and from a want of skill and judgment by three-fourths of the dentists, we shall have little else than plates with which to meet the issue. Teeth can be saved without filling as well as by filling by some operators, but by a few only. Most of the dilemmas which all of us encounter every day are the results of bad dentistry. The plan to meet the difficulty must be one which is founded on such mechanical and physical laws that it can be safely relied upon for resisting both time and the various surrounding circumstances; one which any ordinary operator can follow, and which will be so cheap as to bring it within the reach of all; one which, if by accident the porcelain crown has been fractured, will allow of easy substitution in a few minutes without interfering again with the operation performed on the root. A crown is needed which can be obtained by every operator as easily as porcelain teeth for plate work, and kept in stock by him ready for any emergency and costing but a trifle to replace; a method by which we can take any case of great irregularity, of any age and standing, and, without disturbing the root, cut off the crown and place the porcelain one in the proper curve in the arch; a result which is absolutely clean, and which will make the patient feel safer from accident than any other process of restoration.

Has any such plan been generally practiced? A few have been successful by certain elaborate methods which only the exceptionally skillful could perform, and even then, when a "break-down" came, there was no alternative but to do it all over again, either at the cost of patient or operator.

Since 1871 I have been experimenting in this direction. The grand object in view was to give to the dentist at large such a made-up all-porcelain tooth as would meet almost any requirement.

My first plan (see DENTAL COSMOS, September, 1877) of a bolt and nut planted in the root by gold foil did not succeed, as the safety of the whole depended on the perfect rigidity of the bolt. Gold could not be so packed, save in a few cases. Amalgam overcame this difficulty, a platinum bolt being used instead of a gold one; but this operation was practicable only to skillful mechanics: the average dentist was unable to perform it.

To meet this issue, the all-porcelain crown, without nut, was devised. In looking at the incisor crowns, superior and inferior, one might suppose that with so much cut away from their base, and with the pin-hole running entirely through the crown, the strength would be impaired. So I feared when the idea was first suggested to my mind. But upon trial the strength was found entirely sufficient. The experiments were made by drilling out old-style pivot teeth with a diamond. They are now made in special moulds. With these still greater strength is attained. The incisors are so shaped as to form a dovetail, which allows the strain outward to come high up near the cutting-edge, and not to depend upon the palatal base for support. The bicuspid and molars are cut out at the base, leaving little more than a shell, with undercuts for the amalgam to act as dovetails.

This method leaves no joint on the natural root, and none in the crown, the operation being really an amalgam filling capped with porcelain. The hollow crown enables the operator to fit it in in a very brief time, there being but little material to grind off.

If a fracture occurs, a new crown can be placed with but little fitting on to the old amalgam base, first burring off any excess. When a case is presented where the pulp is not exposed, the hollow-base crown permits of so shaping the root as not to endanger the pulp, and to place the pins on either side of the same into solid dentine. At this time I cannot conceive of a single case occurring that cannot be met by one or the other of the plans herein described and shown clearly in the cuts,—equally adaptable where a number of roots are in continuous circle, or at intervals, or even for a full denture, as the teeth one by one give way; or in making the root of a lateral bear the crown of a central, or *vice versa*; or one or two adjoining crowns where no roots are left. Where more than one crown is needed, the nut and bolt are called for, as in case of accident, or the necessity for readjustment, they can be unscrewed, the fixture removed, repaired in the laboratory, and again screwed in place.

Let me say just here that this plan of nut and bolt is applicable where no roots are present, for fastening one or more plate teeth on a plate instead of by the method of Dr. Bing, in which, if the teeth are broken, they cannot again be readjusted. Such bolts with threads cut upon them can be inserted in any part of a perfect crown or a filled one by the use of amalgam, or gold, if one will use it in such cases.

Next in importance to a crown that will meet all cases are, the bolt which is intended to attach it to the root or roots, and the cement for securing it.

In such cases as are outlined in Figs. 5 and 6, see that the platinum

pin is secure, and so placed where occasion demands that the lower part of the root need not be filled with cement, but that space be left for gases to escape through the tap-hole, which should be made obliquely from near the margin of the gum down below the cement, guarding against the liability of decay again occurring at the cervical margin by beveling well the mouth of the cavity in the root. This once done correctly, there will be no need of again disturbing it. (Before setting the pin in any case the root should be temporarily filled at the apex to insure against abscess.) Cases will present, however, where gases will form and escape. Here perfect security can be obtained by the tap-hole, as before described. This left open a useful root is retained, and without any apparent unpleasant odor. Do not condemn an abscessed root. Such can be made equally successful where the periosteum can be restored to health. Save every old root that has any length, and in which the pin can be well anchored high up, even if the walls are fractured for an eighth of an inch below the gum, or even where the root is split. In such cases dovetailed holes can be made in each fractured part, and the amalgam will hold them together. Even without this if the pin have a good quarter-inch anchorage at the very apex it will be hard to dislodge.

To make doubly sure, when a tap-hole has to be made, that it is open from the apex, pass a fine thread of silk or cotton down alongside of the pin, build up the amalgam around it, withdrawing it after the crown is on and before the amalgam has set, holding the crown firmly while doing it. Or the thread can be introduced through the tap-hole and then passed up to the apex, withdrawing it when the crown is in place. This practice is perfectly justifiable rather than to lose a serviceable root. To a conscientious operator it needs no argument. In a very important root I go so far as to allow or even to force an abscess to form, and then treat it through the pulp-canal and fistula. I save seventy-five per cent. of such cases rather than abandon them.

Do not cut away the root very much, as a trifling space around the three-cornered pointed pin will permit enough cement for strength. Roughen the inner walls of the pulp-canal, and they may be left conical without danger of the pin being withdrawn. One very great satisfaction to the patient, as well as to the operator, is that the rubber dam need never be used. The base of the root can be so prepared with a sharp bur that but little injury is done to the gum, and if it bleeds creasote or chloride of zinc will stop it; or, pressure of the thumb and index finger against the buccal and palatal walls will stop it or any serous discharge while the root is being filled with cement. After that there is nothing to hinder the placing on of the

crown. Be sure before forcing in the amalgam or cement that the apical foramen is closed. For this purpose I use fine zephyr saturated with creasote, except in cases where a tap-hole has to be made.

Only in cases of fracture of the shaft of a root would I use a band, and that should be placed on separately from the crown, not with it. Not a half-dozen times in nine years have I had occasion to use such a band. The use of the platinum pin in the pulp-canal and passed high up obviates any necessity for such band, which is at best unsightly, and, for many other reasons, objectionable. Such a plan admits of no readjustment, and has been used by others only to assist the cement in setting. Cases occur where each root of a molar or bicuspid stand separated. One small pin in each well pressed up gives equally good results.

Never depend upon cutting a female thread in the dentine and placing a screw therein. This can be done, but it is so easy to be deceived that the plan as shown in Fig. 4 is much more desirable because more reliable. It is preferable in such cases to place in the pins and wait until the next visit of the patient, and, before placing on the crown, to try the pins to see if they are well anchored. When more than one crown is to be placed on in a continuous circle or line cut off all the natural crowns at one sitting, instead of finishing one at a time as I once advised. As many as four incisors can be inserted at one sitting, though two is as much as one generally cares to adjust at one time. Where the crowns have been well fitted to a plaster model there will be little difficulty in getting a good arch in the mouth, though a model is not necessary except for the superior or inferior incisors. If you have a large stock of bicuspid and molar crowns on hand the fitting can be done at once. For special cases of very short teeth it would be well to have a plaster model. The only objection ever urged against using amalgam in the roots to secure the pins is that the gums soon look purple or blue. This can only occur where the joint is not high enough above the margin of the gum and where poor amalgam is used. Oxyphosphate or oxychloride of zinc can be used, but I prefer a special quick-setting amalgam such as I am using. Gutta-percha for such an operation is no better than putty. Some cases have succeeded with its use, but it does not at all meet the requirements.

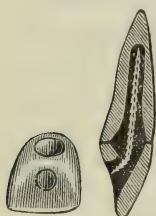
As to the objection against amalgam that it is too plastic and too long in hardening, let me say that in fact such is not the case, unless the ordinary amalgam is used. I have never had to replace in a single case from such cause, where the amalgam I have adopted is used in the crown. For the roots, any first-class amalgam will do that does not take too long to set. The safety is in having it not too soft in the crown when it is pushed home. When the platinum pin is pressed

up in the root with forceps, with the pin resting against the palatal wall of the tooth in incisors, there is no displacement. The pressure made on the crown "squeezes" out all surplus mercury and impacts the amalgam well around the pin, and with a lump of it well pressed or pounded with small points around the pin in the crown from the outside orifice, it holds securely.

When amalgam is used, the shade of the crown should be rather lighter than if a white cement were to be used, as the opacity of the amalgam adds a blue tinge to it, just as in plate teeth the shade is made darker by the stay-plate, after soldering.

Fig. 1 shows the crown of a superior central from the palatal surface, the base cut out high, and with another countersunk hole near

FIG. 1.



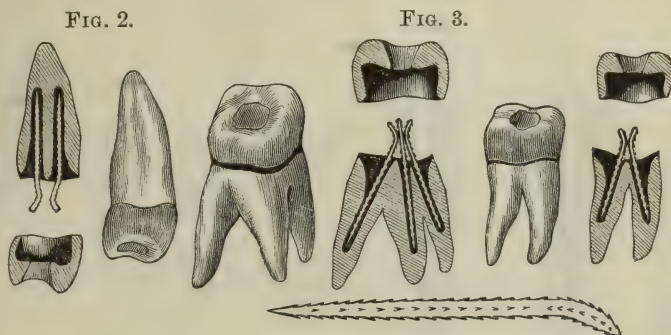
the cutting-edge, and under-cut on the mesial and distal walls, to allow the amalgam to grasp the body of the tooth well up, so that it shall not depend for support at the base only. The base might be cut away after the amalgam has hardened and the crown would not fall off. The base is countersunk to admit of easy and free adjustment of the pin, and to allow of a large body of amalgam around it, making one continuous amalgam filling from the root through

the crown, with no joint for retention of food, the material being stronger than the porcelain. The opening on the palatal surface is convenient as a safety outlet for the amalgam, and permitting the crown to go up to its place without obstruction. When the crown is well pressed up, the amalgam can be packed in around the pins and the amalgam will act as a metallic base or backing for the palatal surface, thereby strengthening it. The thumb or index finger on this orifice prevents the too free escape of amalgam when pressing up the crown. These crowns have no platinum lining or tubes as the English teeth have. They are stronger without them. A sectional view of a central is also shown in Fig. 1, with barbed pin bent at the proper angle, the dark part showing the amalgam.

Fig. 2 shows a bicuspid with double pulp-canal, the cross-section of a crown with countersunk base, and the opening on the grinding surface for the escape of surplus amalgam.

Fig. 3 embraces sectional views of a superior and inferior molar, showing arrangement of pins, with a magnified view of the platinum pin, pointed at each end, made triangular and well barbed, the barbs looking towards the angle of the pin where bent. The perfected crown on the root shows the line of amalgam. When two or more pins are used they need not be placed so far up in the roots or be so large in diameter as when a single pin is used. In cases where the root has to be tapped, then the pins can be placed in the mouth of

each pulp-canal and the tap-hole made below, which should always be done before the pins are inserted, similar to Fig. 4, where there is



a living pulp. Indeed, were it not for the fear of displacement before the hardening is complete pins could be dispensed with in molars, as the body of amalgam is so great that when set it will hold sufficiently. The pins when set like a tripod at the base offer greater security than one alone.

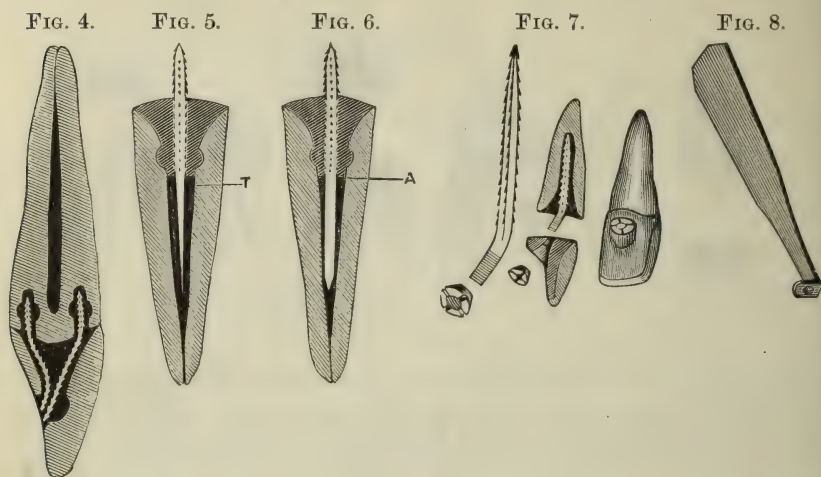
Fig. 4 shows an all-porcelain crown, sectional view, where the pulp is still living. A hole is made on the buccal and lingual sides of the root as far away from the pulp-canal as possible, and of size very little larger than the three-cornered pin, with an enlargement near the opening made with a barrel-shaped bur. The side of the under-cut next to the crown should be as square as possible, not rounded, as in Fig. 4. In such a case the amalgam should be used quite dry, as the pins do not have to be pushed far, and can be well tamped in with narrow steel blunt points so as to make sure that the amalgam is solid. The crown can be placed on at once, or you can wait until the next day to see that the pins are all secure.

Fig. 5 is a sectional view of a case that requires tapping. The pin shows its thin flattened edge, with space on either side for gas to escape from the foramen. It is pressed up about three-fourths of the length of the canal.

Fig. 6 illustrates the same case as Fig. 5, giving a view of the flat side of the pin and showing its bearing on either side of the canal, by which it is prevented from lateral movement, the same as if the amalgam encased it all the way. The gas escapes at the opening at A. (This opening should extend obliquely up to near the free margin of gum, and not as shown in the cut.) The amalgam extends no further into the root than A. This plan holds good in any tooth of one or more roots.

Fig. 7 shows views of a superior central incisor crown as made from a plate tooth (pins crosswise), backed up with heavy gold plate

entirely to the cutting-edge and down to the base where it rests on the root. The shape is given to the palatal surface by an extra plate,



struck up concave with a round tool on lead and nicely fitted up to the backing on the buccal side, extending as high up as the angle or about up to the cross-pins, and filled in with scraps of gold plate and then soldered. The drilling of the hole through the base and the countersinking on the palatal side are done with the engine. The base of the plate tooth should be cut off from the pins down to the cervix to leave more room for the nut. The nut ordinarily goes much closer to the backing than is shown in the sectional view of Fig. 7. The pin is barbed on its three sides and thread-cut on the end passing through the crown. This is done with the ordinary screw-plate before inserting. For central incisors the pin of platinum wire should be No. 16, and for small lateral No. 18. The nut is made of half-round or oval gold wire, about three-thirty-seconds of an inch in thickness. The hole should be drilled before cutting it off from the main piece, and a female thread cut in it by a tap made of an old excavator filed down and run through the hole in a screw-plate of the size of the wire to be used in the root. The slots in the head of the nut should be crucial to admit of the screw-driver (Fig. 9) being used at each quarter of a circle. The nut should be tried upon the threaded part of the pin before being finally inserted, to see that no mistake has been made in the size of either the nut or pin. Such mistakes will sometimes occur. The pin is bent slightly to allow it to pass through the hole in the crown and stand in the countersink equidistant from all sides, so that when the nut is placed on it it will bear on all sides of the countersink alike, and the crown will not be tipped to one side. The

pin, after the amalgam has hardened, can be bent with forceps to suit the countersink, taking care not to bruise the thread. The nut cannot be placed on at the same sitting, as the amalgam will not be hard enough to justify it.

If so unfortunate as to injure the thread, repair it with a little screw-plate, as shown in Fig. 8. This may be made from a piece of steel dividing-file, cut down to about the size shown in cut, and bent at right angles after heating it to a cherry red, and afterwards drilling a smaller-sized hole than the pin, through the short angle, and tapping it with the same tap used in making the gold nut, then tempering it to a dark straw color. This screw-plate can be run up on the pin in the root, and recut its full length to the base. This obviates the removal of the pin after the amalgam has set. Taps and plates of various sizes should be kept on hand in duplicates.

Fig. 9 is a forked screw-driver bent at right angles to admit of getting into the palatal surface to put on the nut. It should straddle the pin and be only wide enough to cover the diameter of the nut.

FIG. 9.

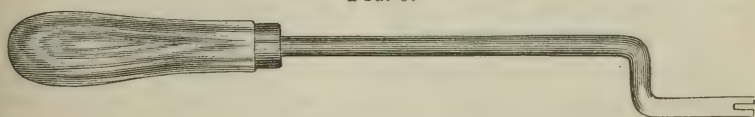


Fig. 10 shows a case of irregularity which was beyond correction, on account of the poor character of teeth, their very ugly shape, their position in the palatal arch, and the age of the patient. In such cases I do not hesitate to cut off the crown, destroy the pulp, and place one of the plate-tooth crowns with a nut. To do so, the crown must be connected to the root by a strip of heavy gold plate, extending for a quarter of an inch or more, to bring the artificial crown into the circle. For such cases the all-porcelain crown will not do. The teeth can be separate or connected. I prefer the former.

FIG. 10.



The nut and bolt is best where a crown has to be very long and there is a close and deep underbite, with little room for the crown, without being too full in front. The gold backing gives greater security, and should cover the whole palatal surface of the tooth. There are other special cases in which this plan is to be preferred, but only for superior incisors or cuspidati.

This plan, as before suggested, I should use in attaching one or more teeth on a small plate, where the roots have been lost, securing the bolt with amalgam to either decayed or sound crowns.

In this plan (Fig. 7) the pin is placed in the same as for all-porcelain crowns, and adjusted before it is set to suit the hole in the base of the crown, placing gutta-percha over the pin in the countersink until the next visit of the patient, when it is removed and the gold nut placed on. All excess of amalgam around the margin of the gum should be removed, and before placing on the crown finally it should be warmed and a piece of gutta-percha stuck on to the base and pressed up, making a water-tight joint when the nut is screwed up.

The illustrations are so accurate that it seems almost unnecessary to enter into any detailed direction as to the manner of procedure; but as it may help to perfect operations, I will do so in few words.

The root or roots having been prepared, and in readiness for the crowns, the canals enlarged, and the foramina closed, the platinum pin is cut off rather shorter than the length of the root, as it cannot be pressed up quite its full length through the amalgam. It is made three-cornered, and pointed at either end—more so at the root end—and well barbed with a sharp knife, as shown in cut, to and from the line between the crown and root, and bending the pin so that it shall impinge upon the palatal wall if for an incisor, which will hold the crown firm while the amalgam is setting.

The crown having been adjusted to its place on the root, and all being in readiness, the canals dry, place soft amalgam entirely up to the end of the canal, and when full, take a pointed, three-cornered excavator and run it up through the amalgam, to force a way for the platinum pin. This latter is placed by grasping the pin with a pair of forceps, and gradually pressing it up as far as it will go. A thin, flat-pointed tool can now be used to condense the amalgam about the pin. Before this is done the crown should be placed on to see whether the pin will permit it to assume its proper place. If not, the crown can be forced either way, and the pin will follow. The tamping around the pin can now be completed, and an excess of amalgam placed around it. The crown is now filled with amalgam and grasped between the thumb and index finger, and pressed hard home. The opening on the palatal side of the crown can be filled with hard amalgam and well driven up about the pin, leaving a surplus for dressing when it is fully hardened. The excess of mercury is pressed out by the force used in driving it into place. When more than one pin is used, they can be filled in between on the grinding surface, and wedged apart against the wall of the porcelain tooth, which will very much assist in retaining them.

This can be done all at one operation, although the pin can be

placed in at one visit and the crown at the next. Where a crown has to be replaced from fracture, cut off the surplus amalgam around the pin with the engine and cutting-pliers until the new crown fits nicely. Fresh amalgam having been laid over the old amalgam, and the crown pressed up as before, the repair is complete. The crowns are not made to allow of their being pressed up over the end of the root, as in the Richmond plan of a gold band, as there is no necessity for the band, save in the few instances named in a former part of this article.

As to many little details, the practitioner can improvise to suit every case. I am of opinion that platinum wire is the best for the pins, although steel well softened will do if entirely covered with amalgam. The cost of platinum is but a trifle more than the steel, and with it there is no danger of oxidation or of injury from the mercury.

I give this plan to the profession with the assurance that there is no other operation in dentistry which will so delight patients. Instead of crowns patched up with gold, amalgam, gutta-percha, etc., you have in this plan "art concealing art," recommending itself to the common sense of the patron and enabling the operator to get well paid for his labor, and suiting itself to the purse of every class of society,—a plan which will enable us to blot from our practice in a great measure the necessity for dental plates.

CLINICAL REPORTS.

PHILADELPHIA DENTAL COLLEGE—DEPARTMENT OF ORAL SURGERY.

SERVICE OF PROF. J. E. GARRETSON.

I PROPOSE allowing the patients of this morning to wait a little time, and to avail myself of the opportunity thus afforded to say a few words to you on the subject of education.

I hold in my hands a number of letters. Whence they come and from whom it is neither proper nor important that you should know. They furnish the text for my thoughts. Every one of these letters contains a word prominently projected,—diploma. In one other respect they are all alike,—showing incorrect spelling.

As your dean, gentlemen, I may be pardoned for intruding a little fatherly advice, for which the intention must be the excuse. It will prove a not unprofitable diversion of a few moments if I succeed in duplicating a lesson on the subject of incompatibles. What, for instance, if I ask you to consider as an example, the relation of a

good diploma and bad spelling. Could a mixture of these be made, think you, which would deceive an intelligent public? Or, where would be the affinity between a parchment certifying proficiency and a tongue proclaiming deficiency? To carry dirt under one's nails is to bear about with him the earth of his grave. To spell incorrectly is to damn one's self. Do I never spell incorrectly? Don't inquire too closely. I do a hundred things in a way that permits of a better; constantly do, and have done, so many as to have forced into me the grace of charity. Happily, or unhappily, as the case may be, I speak to you out of experience.

Let me tell you the story of a first experience. Hopping out from the nest of a village office a long time before his pin-feathers were grown, a young man started once on the diploma business,—that is, he permitted himself to be called doctor; the right of the matter to the public and the wrong to himself he did not stop to consider; a dentist was a doctor and he was a kind of dentist. One evening shortly after this graduation a learned gentleman invited the doctor to spend an hour in his library. Soon the subject of an accident that had occurred during the day to a man's knee-pan came up; the savant appealed to the doctor for the technical name; the doctor scratched his head but failed to remember it. That, however, passed fairly well. The savant wanted next to talk about eyes; he wanted the name of the retinal ganglion. Myopia prevented the doctor seeing it. The savant had the audacity to ask what was taught at the college that made the doctor a doctor.

A diploma, even a faculty-manufactured diploma, is a satisfaction to a man only in proportion as he carries the meaning of it in his head. Nobody knows that better than the doctor who addresses you. He now has half a dozen, yet never for double a half-dozen years has he taken one of these out of its case, being ashamed to face it.

Some of you, young gentlemen, have written letters about diplomas. I hope the word has by this time almost gone from your minds; that you have become more intent on getting knowledge than parchments. I trust you have already found something very much better than a diploma, namely, the key to study. Find that, and a man has the "open sesame."

In our beautiful park your eyes not infrequently meet with signs bearing the inscription: "These flowers are under the care of the public." Knowledge is under the care of a man's self. Teachers teach, students learn, the mouth frames speech, but it is the ear that takes in the word. As dean, as professor, I have opposed and am opposed to compulsory professional education. Compulsion will no more make a scholar than will skill weave a sow's ear into a silk

purse, or than will voice get information into ears having no sense of hearing or defiantly closed to instruction. Put the thing before the student, that is all; let him take or leave. The place does not exist where the opportunities to get information are greater than here in this great city of hospitals and general culture; the place is nowhere that less may be gained. It is for you, young gentlemen, to take or leave.

It is common for the inexperienced to prate of examinations as correctors of deficiencies. Examinations are bosh. A man with a good memory makes the professor's vote ten, while his mate with a poor one wins only five. I have been too long a teacher to be caught by any such chaff. I have heard a parrot pronounce well, but I have never seen the bird which could parse: I prefer a parser.

We are here learning to parse, not exercising memory. An item of principle is worth a note-book full of recipes. Get a principle and you have the recipes without the trouble of writing them down. I beg that you will lose no moment in studying unnecessary detail. Education has the meaning of an index, and the meaning of an index is to tell where to find a place or thing.

Apropos of an index, I own a dictionary, and my poor memory makes it necessary for me to consult it every day. It is by education that I know the meaning of a dictionary. Now, the writers of these letters held in my hand have, without doubt, poor memories. Am I to conclude them as well without education? Not necessarily: they may simply be careless. One or the other, however, assuredly they are. Either is alike inexcusable in a professional man. Don't forget the hint when you have letters to write. Faulty spelling is to be condoned only by a dean living in a house too full of windows to permit the throwing of stones.

A word more about the indices. In an index lies the whole meaning of college-life. You are to learn here of the things that pertain to professional education. You are not, however, expected to shovel these things into your brain. Books are repositories into which they are already shoveled. No man out of ten thousand has a memory that can get along without books. But what is the use of a gold mine if a man knows nothing of its location? Half the books written in English are Greek to English readers. The best investment a professional man makes of the earnings of his first few years of practice is in books, and in that education which teaches the use of books. Books tell a man all that is known,—about all that has been found out. A man's most profitable companions are the volumes of his library. Buy books, young gentlemen.

Do not fret yourselves with memorizing names. That is not at all the way to study. For example, let anatomy be considered. Who

ever found himself able to do anything with it until he had exposed to him on the dissecting-table the secrets of the pages as expressed in our mnemonical associations? I think just now of the poor fellows, scattered all over the country, who are preparing to enter colleges next winter, and who are confounding their senses by the big words and long-drawn sentences of this heavy subject. You smile; and naturally. With the cadaver before them, they will behold a new revelation. The high wall will be seen to be nothing but a low fence.

A word about oral surgery, which seems to your speaker to have a marked future before it. This for the reason that a growing general intelligence expects and demands the assumption, on the part of somebody, of such duties as are implied in oral surgery; the somebody must know dentistry for the reason that oral surgery is to be understood alone by him who understands this art.

There is another reason why a near future must alter the status of the dental profession,—the saving of teeth is becoming less and less a mechanical act. Science is considering cause. To make exquisite fillings in teeth will for a very little time longer distinguish the dentist of the office from the metal-worker in a shop.

Still another reason is there,—education. We do what we know how to do. Many who know how to make fillings of all kinds have yet learned how to do more with prescriptions than can be done with the metals of the universe.

With brains replacing fingers, requirements are more quickly accomplished, and other tasks are undertaken; so, naturally, will all diseases of the mouth, jaws, face, teeth, and associate parts get under the care of one and the same practitioner; so, naturally, will there stand before the community specialists distinguished as oral surgeons.

We will pass to our cases.

TRANSLATION.

ATMOSPHERIC PRESSURE PLATES.

TRANSLATED FOR THE DENTAL COSMOS.

IN the use of caoutchouc plates one great difficulty is the palate-plate. Whatever one's opinions may be of the conduction of heat, the irritation of the membrane that it produces is undeniable. This is increased by uncleanness and by wearing the plate at night, a practice that should always be discouraged. In cases, however, where the character of the tissue is flabby, the use of the plate during the daytime and the accumulation of membranous secretions produce an irritation

sufficient to cause inflammation, softening, and extreme sensitiveness of the tissue. Again, the gradual progress of resorption of the alveolus causes inevitably an increased friction of the plate on the gum or the palate, which tends in no slight degree to irritate this part of the membrane. This irritation is increased when a suction-cavity made very deep is used. Another objection to the palate-plate is the discomfort caused by it, and its dulling the sense of taste. It is true most patients soon get accustomed to this, but it is an established fact that every one is better pleased with a set without the palate-plate than one with. These considerations have induced me to invent a method by which artificial teeth may be inserted firmly without the aid of a palate-plate, and without any attachment to the remaining teeth or to the under set. The set covers the edge of the alveolus, and a small strip is turned over on the inner side. As the set is to take up as little room as possible in the mouth, the indications for a suction-plate would, as a matter of course, always have to be favorable. Also there would have to be a firm basis of either healthy roots or a firm and healthy membrane. The pressure exercised on the upper set by the lower jaw must be properly distributed, the strongest pressure on the bicusps and first molars; over the whole surface the pressure should be weaker on the outer and stronger on the inner edge. If the natural molars are still in the lower jaw, the position of the corresponding teeth in the upper set will have to be decided by them. If, on the contrary, the under teeth must also be artificially restored, they should be so arranged that their grinding surfaces incline slightly towards the inside of the mouth. By this means the corresponding teeth in the upper set acquire an equal inclination towards the outside, thus bringing the pressure on the middle of the teeth and increasing the firmness of the plate. In cases where the natural molars are still in the upper as well as in the under jaw, and where consequently only front teeth have to be inserted, the indications are decidedly against a suction-plate.

After these general prefatory remarks, I will proceed to the details of my method. It being my object to keep the space towards the gums as free as possible, I take up, as a matter of course, all the free portion of the alveolar edge; all missing teeth must be replaced. Before modeling the set in wax I outline its exact size on the plaster cast, especially towards the gums. In cases of resorption the width, measuring from the alveolar border inwards, is from nine to twelve millimeters. If, however, teeth or firm roots are still in the jaw, the set must be made (measuring from the inner edge of the root inwards) from five to seven millimeters wide. The firmness of this narrow set I attain solely by means of a suction-cavity of my own construction;

always provided that the position of the teeth is correct, it follows from the form of the set that the suction-cavity must be different from the one ordinarily used in its shape as well as in its position. It is not, as is usual, round, but forms a narrow strip from three to four millimeters wide and from one to two millimeters deep; a deeper suction-cavity I consider unnecessary and injurious. In cases where roots still remain in the jaw, this cavity begins close behind them; in cases of resorption, from four to five millimeters inside the alveolar border. The length of this cavity is governed by that of the set. It must be a centimeter shorter than the latter on either side.

By this change alone is it possible to do away with the palate-plates. A vacuum is produced throughout the whole length of the set, which by reason of its being curved has a far better effect than when in the middle of the palate-plate. Other forms of this suction-cavity, as, for instance, small round or square depressions side by side, do not produce the desired effect. In order to facilitate the suction of the plate, I cover the surface of the caoutchouc with a slight roughness, which I effect in the following manner:

After modeling the set in wax it is put into the plaster-flask in such manner that in taking it apart the teeth will remain in the one-half of the flask and the model in the other. The wax is now melted out and the caoutchouc packed in. When this has been done, a piece of coarse tulle, correspondingly cut and drawn through plaster-water (to facilitate its removal), is placed upon it, and the flask is closed. The tulle must always be a millimeter from the edge of the set. After the caoutchouc has become hard the tulle is easily removed, leaving the set covered with slightly-rounded impressions that materially aid its suction without producing any irritation of the membranes.

It is now about a year since I first tested this method satisfactorily. Formerly I had another method of preventing the injurious effects of caoutchouc on the membrane that succeeded very well, and of which I still make occasional use. This consists in covering the rubber with a solid covering of gold, as follows:

Soft gold foil (seven parts fine gold, three parts fine silver) is rolled as thin as possible. From this I cut a piece the size of the set, allowing the caoutchouc to protrude beyond it a millimeter all round. When the gold has been thoroughly heated I place it, wrapped in a piece of tulle, between two bits of pasteboard on the anvil, and give it a blow with the hammer, thus leaving the impression of the tulle on the foil.

When sufficient rubber has been packed in the flask I cover its whole surface with a solution (caoutchouc and chloroform), and treat the gold in a similar manner. I cover that side of the gold with solu-

tion on which the threads of the tulle appear raised. The gold is now placed on the caoutchouc and the flask closed. If the gold comes too near to the edge of the plate, lay a thin strip of rubber over the gold. If a suction-cavity is desired, it may be made by means of a piece of pasteboard cut properly, which, placed on the gold, leaves its impression on both gold and caoutchouc. After vulcanizing, the gold remains firmly attached to the caoutchouc, and may then receive a thorough polishing with sand.

The advantages of this method are by no means inconsiderable; the heat and dryness produced by caoutchouc are entirely done away with, as well as all irritation. The gold can be worn and polished for years without sealing.

Latterly, however, I prefer the first-described style of suction-plates, and in these, too, I make use of a gold base, as it offers greater advantages.—*M. Hagelberg, in Deutsche Vierteljahrsschrift für Zahnheilkunde.*

H. J. T.

PROCEEDINGS OF DENTAL SOCIETIES.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE regular meeting of the Odontological Society of Pennsylvania was held Saturday evening, April 3, 1880, at the residence of Dr. H. C. Register, No. 1907 Chestnut Street. Dr. Register was called to the chair.

INCIDENTS OF PRACTICE.

Dr. Register. I would like to ask the members of the society if they have done anything in the way of grafting artificial crowns upon natural crowns and roots. Dr. Bing, of Paris, was, I believe, the first to insert a single tooth in this way, where the root had been lost. Since then (five years ago) I have increased the number to two, three, and four teeth, and have just completed an operation of seven. I have met with but one failure. Dr. Webb performed an operation last summer before the State society similar to the Bing plan, which consists of a bar entering two approximal teeth which were supposed to be devitalized, the pulp-canal being used for anchorage. Now, for a single tooth I do not think it necessary to let the bar enter two teeth, as both these operators do,—one tooth being, in my judgment, sufficient; but for any additional number it becomes a necessity. In fastening the crown or crowns, the bar should always enter the cavity and be bent at a right angle, as the letter L; when more than one tooth is grafted, a right angle at *each end* of the bar, turned either way, is required; when this is built upon, it is held in all directions. If the pulp is dead this right angle should enter the canal; if alive,

it should be in an opposite direction (towards the cutting-edge), and necessarily shorter. The method of fastening these teeth is with either gold or amalgam, the mallet always being used with either material. Persons who wear them say they can masticate with them, and entirely forget their presence in the mouth.

Dr. Essig. Within a few days I saw a somewhat similar fixture, to which was attached seven or eight artificial teeth. A piece of platinum wire rested upon the cutting-edges of the teeth; the extremities of this wire were secured by foil packed into the crowns of the first molars on either side, and the bar was also anchored at other points in the canines. To this wire porcelain teeth were soldered with pure gold, the backings being of platinum. The object of the fixture was to take the place of a small gold plate, made in the usual way, which the patient had previously worn, and which was supposed to cause a condition of redness and tenderness of the tissues upon which it rested similar to that occasionally observed when vulcanized rubber is worn. It had been in position about two years. Two or three of the natural teeth upon which the wire rested, as well as those to which it was anchored, had decayed, and one or two were completely broken down. The platinum bar did not touch the gums, but rested upon the teeth in such a way as to allow the antagonizing teeth to bite upon it. It was a bold attempt to perform an extensive operation, and might have been successful had it been properly done. It showed, however, hasty and imperfect manipulation. I have confidence in this method of fastening artificial crowns as performed by Dr. Webb, as thoroughness with him is a *sine qua non*.

Dr. Dixon. Does any gentleman know the percentage of such cases in which Dr. Webb has been successful?

Dr. Longnecker. I do not know the percentage, but he has been successful in a number of cases. I have inserted some myself, and secured them with oxychloride.

Dr. Register. I use the electric mallet to condense the amalgam prepared in a dry manner. I use platinum pins and not gold; the mercury will eat away the latter.

Dr. E. H. Neall. I wish to say a few words upon the manufacture and use of the hard rubber and corundum disk. My attention was first called to their excellence some seven years ago, by receiving a number as a premium for subscription to the *Pennsylvania Journal of Dental Science*. I used them with a great deal of satisfaction; they cut quickly and smoothly, and were especially useful in finishing gold fillings. Since then I have endeavored to procure others, but without success, as their manufacture soon ceased from some unexplained cause. Disks of other kinds, such as the diamond, hard rubber, soft rubber, celluloid, felt, etc., can be obtained in abundance, but these

are not for sale to my knowledge. From several experiments which I have made during the last three months, I am satisfied that these disks can be made exceedingly thin, and can be used without danger of breaking, and will be found to outwear twenty of the ordinary corundum disks. I obtained the best results by chipping four dwts. black rubber very fine, and incorporating with it five dwts. No. 60 corundum with the fingers, while the rubber was softened in a small dish held over a Bunsen burner. After thorough kneading, small pieces were placed in moulds in the ordinary Star flask, and vulcanized for fifty minutes, at three hundred and twenty degrees of heat, care being taken to bring up the heat to that point very slowly. This amount will be found sufficient for twelve large disks and points.

Dr. Dixon. Have any of the gentlemen present anything to say as to their experience with the use of tin foil for fillings? My own observation of its results, especially in frail teeth, has so favorably impressed me that I feel anxious to hear from others upon the subject. I believe for many teeth it is better than gold.

Dr. Tees. I have not inserted half a dozen tin fillings since I have been in practice. When it is not advisable to use gold I prefer amalgam, oxychloride or oxyphosphate of zinc. I always fill temporary teeth with amalgam because it is easily and quickly introduced.

Dr. E. R. Pettit. There are many cases in which I do not think we are justified in filling teeth with gold; as, for instance, the teeth of an extremely nervous child or woman when the operation would be tediously long. In such cases the strain upon the nervous system is so great that I feel justified in using amalgam in preference to gold. The nervousness of the patient prevents a satisfactory operation, and in all probability a gold filling inserted under such circumstances will last no longer than one of amalgam, probably not as long.

Dr. Dixon. I dislike to make use of amalgam because it is objected to by many physicians; and some of them do not hesitate to speak disparagingly of those who use it.

AMBLER TEES, D.D.S., A.M.,
Recording Secretary.

HARVARD UNIVERSITY—DENTAL DEPARTMENT.

THE following are the names and residences of the graduates of the dental department of Harvard University, at the commencement held June 30, 1880:

Frederic Eugene Ayer.....	Lawrence, Mass.
Albert James Colgan.....	Boston, "
Arthur Ernestine Lewis.....	Plymouth, "
Virgil Clarence Pond.....	Framingham, "
John Scott Mason.....	Saco, Me.

SOCIETY FOR THE ADVANCEMENT OF ORAL SCIENCE.

At a meeting of dentists held in Boston, May 17, 1880, a society was organized, a constitution and by-laws were adopted, and the following officers were elected:

President.—Joshua Tucker.

Vice-Presidents.—D. M. Parker and George T. Moffatt.

Treasurer.—Jacob L. Williams.

Secretary.—William Herbert Rollins.

PREAMBLE.

Recognizing that science is the foundation of every art; that in any department of a profession sound opinions and safe practice can only result from knowledge of general principles; this society is formed to promote the application of thorough professional learning to oral practice.

CONSTITUTION.

Name.—Society for the Advancement of Oral Science.

Membership.—Each member must be a graduate of some medical school approved by the council.

Honorary Membership.—Persons distinguished in science may be honorary members. If they are practitioners of any department of medicine, they must be graduates of some medical school approved by the council.

Object.—The advancement of oral science. The society holds,—

First. That all special degrees in medicine should be abolished.

Second. That oral professorships should be established in the medical schools.

Third. That oral hospitals should be created, in which students should receive instruction during and after their medical course.

Fourth. That every person practicing any department of medicine should be a graduate of some reputable medical school.

CALIFORNIA STATE DENTAL ASSOCIATION.

THE California State Dental Association met in San Francisco, June 10, 1880.

The following officers were elected for the ensuing year:

President.—William J. Younger, D.D.S., M.D.

Vice-President.—S. E. Knowles, D.D.S., M.D.

Secretary.—S. E. Goe, D.D.S.

Corresponding Secretary.—H. E. Knox, D.D.S.

Treasurer.—Dr. J. J. Birge.

Librarian.—F. A. Brewer, D.D.S.

Adjourned to meet in San Francisco, June 14, 1881.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE annual meeting of the Odontological Society of Pennsylvania was held Saturday evening, May 1, 1880, at the office of Dr. C. J. Essig, No. 1533 Locust Street, Dr. Daniel Neall in the chair. The following officers were elected for the ensuing year:

President.—Daniel Neall.

Vice-President.—F. M. Dixon.

Recording Secretary.—Ambler Tees.

Corresponding Secretary.—M. H. Webb.

Treasurer.—E. H. Neall.

Librarian.—W. G. A. Bonwill.

Executive Committee.—C. J. Essig, Louis Jack, E. T. Darby.

AMBLER TEES, D.D.S., A.M.,
Recording Secretary.

HARVARD ODONTOLOGICAL SOCIETY.

THE second annual meeting of the Harvard Odontological Society was held on Tuesday, July 6, 1880, at Boston, Mass.

The following officers were elected for the ensuing year:

President.—Dr. E. B. Hitchcock.

Recording Secretary.—Dr. J. G. W. Werner.

Corresponding Secretary.—Dr. E. S. Niles.

Treasurer.—Dr. Frank Perrin.

Prudential Committee.—Drs. J. G. W. Werner, D. F. Whitten, E. F. Banfield.

J. G. W. WERNER, *Recording Secretary.*

NORTH CAROLINA STATE DENTAL ASSOCIATION.

THE North Carolina State Dental Association held its sixth annual session in the city of Raleigh, N. C., Tuesday, June 1, 1880, and after a very pleasant and interesting meeting of three days adjourned, to meet in Asheville, N. C., the third Tuesday in July, 1881.

The following officers were elected for the ensuing year:

President.—Dr. Isaiah Simpson, Winnsboro', S. C.

1st Vice-President.—Dr. J. F. Griffith, Salisbury, N. C.

2d Vice-President.—Dr. J. D. Clark, Newbern, N. C.

Secretary.—Dr. W. H. Hoffman, Charlotte, N. C.

Treasurer.—Dr. J. H. Crawford, Raleigh, N. C.

Delegates to the National Dental Association, New York.—Drs. J. W. Hunter, Salem, N. C.; V. E. Turner, Raleigh, N. C.; E. L. Hunter, Enfield, N. C.; M. A. Bland and W. H. Hoffman, Charlotte, N. C.

W. H. HOFFMAN, *Secretary.*

AMERICAN DENTAL CONVENTION.

THE American Dental Convention will hold its next annual meeting in the city of New York, on the 11th day of August, 1880.

The above time and place have been selected in order to meet the wishes of the Southern Dental Association, who propose to meet with us.

It is hoped that the profession will embrace this opportunity to meet our Southern brethren, and unite with them in again consolidating in one national organization.

By order of the committee of American Dental Convention.

J. G. AMBLER, *Chairman*.

NATIONAL DENTAL ASSOCIATION.

THE next annual meeting of the National Dental Association (late Southern) will be held in New York City, on Wednesday, August 11, at ten o'clock A.M. Further particulars will be timely given through circulars from committee of arrangements. All are invited.

E. S. CHISHOLM, *Recording Secretary*.

FIFTH DISTRICT DENTAL SOCIETY.

THE Fifth District Dental Society of the State of New York will hold its twelfth semi-annual meeting at Syracuse, Tuesday, October 12, 1880, for one day only, and will be called to order at 9 A.M. The Board of Censors will be in attendance to examine candidates for admission to the society. Members of the profession from other societies are cordially invited to be present and take part in the discussions.

I. C. CURTIS, *Secretary*.

AMERICAN DENTAL SOCIETY OF EUROPE.

THE American Dental Society of Europe will hold its eighth annual meeting in Lucerne, on Monday, August 30, 1880, in the Hotel Schweizerhof. The meeting will be organized at ten o'clock A.M., and the sessions continued until all business is finished.

J. W. CRANE, *Secretary*.

EDITORIAL.

COMPLIMENTARY.

THIS issue of the DENTAL COSMOS will be sent to every English-speaking dentist whose address we have,—the edition being seventeen thousand. This number contains sixty-four pages of reading matter,—eight in excess of the usual amount. The contents are varied and interesting, and cannot fail in one respect or another to be instructive to every dentist. The DENTAL COSMOS has, we think, fairly earned the distinction of being the leading journal of its class in the world. Its subscription list has steadily and rapidly advanced not alone in America, but in every quarter of the globe, until the name of almost every practitioner of repute, wherever located, is to be found among its readers, aggregating a circulation altogether unprecedented in the history of special medical journalism. It is known everywhere as a *distinctively dental* journal,—a reputation which it is our constant and earnest effort to maintain,—only contributions and selections which have a direct bearing on the calling of the dentist being admitted to its pages. We submit that, as an exponent of the science and art of dentistry, no practicing dentist can afford to be without it.

ANOTHER NEW DEPARTURE.

WHILE the advocates and opponents of the so-called "New Departure" are demonstrating that, as in courtship across a fence, there is a good deal to be said on both sides, an interest seems to have sprung up in quite a different direction, and which is enough in contrast with previous customs to entitle the movement to be called a new departure. The art of replacement, or "Prosthetic Dentistry,"—a term which appears to be superseding that of mechanical dentistry,—seems to be coming to the front, and is to a considerable extent engaging the thoughts of practitioners. The desire to save the natural organs and to preserve their usefulness not having been satisfactorily accomplished either by separations, by contours, or by plastics, one or all, is yet further manifested in the effort to utilize any portion which has survived in consequence of skill or from its lack. The problem as to the "best base" is not thought of, except for mouths that are edentulous; all that is needed nowadays being a root here and there to serve for anchorage. There are notable indications of an awakening with reference to dental prosthesis. To use a word which has become popular in various relations, there seems to be a "boom" in mechanical dentistry. Let us hope that it may continue; it has come none too soon.

DENTAL NECROLOGY OF THE LAST DECADE.

WITHIN the last decade a more than usual number of men distinguished in various relations to dentistry have passed away,—some who, by reason of age and previous long retirement, were scarcely known to the younger members of the profession; some whose name and fame were established throughout the civilized world, and whose death is of so recent date that not to have known of them and to have recognized their worth was impossible. Most of those in the following list had acquired at least a national recognition for their services to dentistry, in authorship, practice, or manufactures:

Robert Thomas Hulme.	Elias Wildman.
James B. Bean.	Solyman Brown.
Christopher Starr Brewster.	Philip H. Austen.
Samuel W. Stockton.	George T. Barker.
B. T. Whitney.	C. A. Du Bouchet.
Royal W. Varney.	Gilbert A. Foster.
J. F. B. Flagg.	Henry Reginald Noel.
Amos Westcott.	John Hugh McQuillen.
George E. Hawes.	Henry Smale.
Thomas Barnes Hitchcock.	Samuel S. White.
Ely Parry.	John Smale.
Edwin Sercombe.	George W. Rutterford.
Richard M. Gage.	S. P. Cutler.
Asa Hill.	Thomas Bell.
Eleazar Parmly.	Robert Arthur.

MERCHANTABLE TITLES.

SOME of our correspondents, graduates of American dental colleges, but practicing abroad, are concerned lest the recent exposé of the traffic in degrees should lessen the value of their honestly obtained diplomas. There will doubtless for awhile be some uncertainty with reference to the matter in the minds of those not well informed, but there need be no fear that any permanent undervaluation will be made of diplomas which ever were worth possessing. The holder of a bogus certificate may well feel, however, the depreciation resulting from an exposure not only of its worthlessness, but of the unworthiness of the man who hoped to sail securely under its false colors.

One gentleman desires to know why, after the ventilation which the so-called "American University" has had, one of his neighboring practitioners should still allow its diploma to hang on the wall of his office. We cannot tell, unless it is for the same reason that a donkey eats thistles,—because he is a donkey.

THE FIELD WIDENING.

ONE has only to read the announcements of the various dental colleges for the sessions of 1880-81 to see that the necessity for a broader culture than has heretofore been judged sufficient is being generally admitted and acted upon. Branches of study are now included in the curricula which until recently were not thought necessary. It is becoming more and more apparent that a specialist should be a medical man in the scholastic sense of the term; should have a range of thought only possible as the result of a more general professional culture. The ranks of the profession are being recruited year after year by better educated men than formerly, and the necessity for a higher professional standard is constantly increasing. We are glad to observe that these facts have been recognized by the dental colleges, and that there is a growing disposition on their part to accommodate themselves to the enlarged demands.

HINTS AND QUERIES.

WE again call attention to the department of the DENTAL COSMOS entitled "Hints and Queries." Though a minor division, it is, we are assured, very highly appreciated by many of our subscribers. The queries in many instances call forth instructive replies, which benefit others beside the querist, while the practical suggestions and fragments of experience contributed from time to time have in more than one instance given rise to fuller discussion of the topic in the form of original communications. We once more invite all who desire information on any subject connected with dental practice to put their query into plain, terse form and send it to us. We likewise urge all who have positive convictions in reference to the subjects embraced in the queries to contribute the desired information.

THE NATIONAL CONVOCATIONS.

ACCORDING to announcement the American Dental Association will hold its twentieth annual session, August 3, 4, 5, and 6, at the hall of the Massachusetts Institute of Technology, Boston, Mass.

The American Dental Convention will hold its twenty-sixth annual meeting in New York City, August 11.

The National Dental Association (late Southern) will meet in New York City, August 11.

A mass convention of the dentists of the United States, for the purpose of organizing a National Dental Association, will be held in New York City, August 11.

THE DENTAL COLLEGES.

We present the following list of the dental colleges of this country and Canada, with the names and addresses of the deans:

BALTIMORE COLLEGE OF DENTAL SURGERY. F. J. S. Gorgas, Dean, 259 N. Eutaw St., Baltimore, Md.

OHIO COLLEGE OF DENTAL SURGERY. H. A. Smith, Dean, 286 Race St., Cincinnati, Ohio.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY. C. N. Peirce, Dean, 1617 Green St., Philadelphia, Pa.

PHILADELPHIA DENTAL COLLEGE. James E. Garretson, Dean, 1537 Chestnut St., Philadelphia, Pa.

NEW YORK COLLEGE OF DENTISTRY. Frank Abbott, Dean, 22 W. Fortieth St., New York, N. Y.

* MISSOURI DENTAL COLLEGE. H. H. Mudd, Dean, 502 N. Fourteenth St., St. Louis, Mo.

BOSTON DENTAL COLLEGE. J. A. Follett, Dean, 219 Shawmut Ave., Boston, Mass.

HARVARD UNIVERSITY, DENTAL DEPARTMENT. Thomas H. Chandler, Dean, 74 Commonwealth Ave., Boston, Mass.

DENTAL COLLEGE OF THE UNIVERSITY OF MICHIGAN. J. Taft, Dean, Ann Arbor, Mich.

* WESTERN COLLEGE OF DENTAL SURGEONS. Henry Fisher, Dean, 1129 Washington Ave., St. Louis, Mo.

UNIVERSITY OF PENNSYLVANIA, DENTAL DEPARTMENT. Charles J. Essig, Secretary of the Dental Faculty, 1533 Locust St., Philadelphia, Pa.

DENTAL DEPARTMENT OF THE UNIVERSITY OF TENNESSEE. R. Russell, Dean, 53 N. Summer St., Nashville, Tenn.

INDIANA DENTAL COLLEGE. Junius E. Cravens, Secretary, 46 E. Ohio St., Indianapolis, Ind.

DENTAL DEPARTMENT OF VANDERBILT UNIVERSITY. W. H. Morgan, Dean, Nashville, Tenn.; R. R. Freeman, Secretary, Nashville, Tenn.

* ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO. J. Branston Willmott, Secretary, Mechanics' Instituté, Toronto, Canada.

A dental college has been chartered and organized in San Francisco, Cal., under the title of the Cogswell Dental College of the University of California. We have not received its announcement, but have been informed that it is intended to be put in operation the coming fall. Address Dr. S. W. Dennis, 33 Kearney St., San Francisco.

* We have not received the official announcement of this college for the session of 1880-81. The information is taken from the announcement of the last session.

BIBLIOGRAPHICAL.

THE MICROSCOPIST: A Manual of Microscopy and Compendium of the Microscopic Sciences,—Micro-Mineralogy and Micro-Chemistry, Biology, Histology, and Practical Medicine. Fourth Edition. Greatly Enlarged. With Two Hundred and Fifty-two Illustrations. By J. H. WYTHE, A.M., M.D., Professor of Microscopy and Histology in the Medical College of the Pacific, San Francisco, Cal. Philadelphia: Lindsay & Blakiston, 1880.

This standard work, the first edition of which appeared in 1851, comes to us in the fourth edition very much enlarged and greatly improved,—a handsome octavo volume of four hundred and thirty-four pages, well and profusely illustrated, and containing numerous colored plates; printed in large, clear type, and on fine thick paper.

The opening chapter is devoted to the history of the microscope, its application to science and art, and the progress of microscopy. Succeeding chapters describe the microscope from its simplest to its most complex form; its accessories, its care, its use; mounting of microscopic objects, etc. These are followed by chapters on its application to mineralogy, geology, chemistry, biology, vegetable histology, botany, zoology, animal histology, pathology, diagnosis, and etiology. While the chapters on animal histology and the microscope in pathology and medicine are the best and most thoroughly discussed, yet as a practical manual on the use of the microscope for naturalists and scientists, as well as physicians,—a compend of microscopic science,—it seems to be in all respects a thorough and reliable guide, and will continue to be of great service to the student of nature, as well as to the medical student and practitioner.

A glossary is appended, giving in clear, brief terms a definition of the scientific terms used throughout the book. The index is full, and has evidently been carefully made.

THE PRACTITIONERS' REFERENCE BOOK. By RICHARD J. DUNGLISON, A.M., M.D. Second edition, revised and enlarged. Philadelphia: Lindsay & Blakiston, 1880.

This octavo volume of four hundred and seventy-six pages contains in accessible form a great mass of information on important and practical subjects not otherwise attainable, except by reference to numerous professional treatises. The matter has been intelligently selected, carefully condensed, and is of every-day value, including chapters on therapeutics, posology, toxicology, incompatibles, pharmacy, hygiene, dietetics, disinfectants, diagnostic syllabi, obstetric memoranda, hypodermic medication, medicated baths, etc.

We cordially recommend the volume as a reliable and valuable "handy book."

THE SKIN IN HEALTH AND DISEASE. By L. DUNCAN BULKLEY, M.D. No. X. American Health Primers. Philadelphia: Presley Blakiston, 1880.

Dr. Bulkley has condensed in this small volume a large amount of useful information on the subject of skin diseases. A very concise and clear account of the anatomy of the skin is given in the first division of the book, which is well adapted to make what follows intelligible to the lay reader, for whose use these primers are intended. The remarks about the care of the skin in health, about popular errors in regard to skin diseases, about the diet and general hygiene required in these affections, are all so clearly written and so instructive as to give rise to the desire that a larger portion of the space had been occupied with these matters, and less devoted to pathology and symptomatology, which could only, of course, be very imperfectly treated in a work of this size.

Throughout the book, however, we find judicious advice which will be of value to the many intelligent people who are uninformed as to the matter of cutaneous ailments, and who so frequently fall victims to advertising quacks. It may also teach them to avoid the use of proprietary soaps, lotions, powders, cosmetics, etc., with which the market is flooded. The chapters on poisoning, on acne, on baldness, on boils, and on syphilis may be mentioned as especially praiseworthy in the degree to which they fulfill the difficult task of rendering such subjects comprehensible and interesting to the non-professional reader. If this set of health primers were read in every household they would do a grand work in the discouragement of quackery and in promoting the health and comfort of the community.

RICHARDSON'S MECHANICAL DENTISTRY.

Messrs. Lindsay & Blakiston have in press a new edition of Richardson's Mechanical Dentistry. This, the third edition, has been much enlarged, and will contain nearly two hundred illustrations. Great labor has been given to the preparation of this new edition to make it one of the most complete works in print on the science of which it treats. The author has subjected the volume to a careful and thorough revision, with the object of making it a faithful reflex of the most advanced thought and experience of the profession in all essential matters relating to the appliances, methods, and principles appertaining to the department of Prosthetic Dentistry. The most approved appliances and methods of manipulating celluloid are given, as also the method of attaching teeth to a metallic base by means of rubber or celluloid. The modern methods of attaching artificial crowns on roots have received careful consideration by the author.

OBITUARY.

ROBERT ARTHUR, M.D., D.D.S.

ROBERT ARTHUR, son of William and Anna Arthur, was born at Calverton, near Baltimore, Md., July 22, 1819, and died June 22, 1880, at Baltimore, of embolism, which occluded the main arteries of his right leg, resulting in gangrene. His early education was received at ordinary private schools near his home. At the age of about fifteen he was thrown upon his own resources, and entered a printing-office. He was at length induced to commence the study of dentistry, when he placed himself under the instruction of Dr. Chapin A. Harris, and entered the Baltimore College of Dental Surgery. In due time he graduated, receiving the first degree of D.D.S. ever conferred. During the period between leaving school and his graduation in 1841, he by study and a wide course of reading acquired a good education, which extended to the languages,—Latin, Greek, French, and German. He practiced for a short time after this latter period in Philadelphia, then removed to Baltimore, practicing in winter and spending his summers itinerating among the leading planters of Virginia. On his marriage, in 1847, to Mary Hemple, of Philadelphia, he opened an office in Washington, D. C., where he practiced with eminent success for seven years. At this time the honorary degree of M.D. was conferred upon him by the Washington University of Baltimore. He was largely instrumental in the organization of the Philadelphia College of Dental Surgery, which was established in 1852, and of which he filled the chair of Principles of Dental Surgery. He gave up his practice in Washington in 1854, and removed to Philadelphia to be near the school.

He became dean in April, 1855, thus holding this position during the revolution in the institution consequent upon the Board of Corporators insisting on the right to confer the honorary degree regardless of the wishes of the faculty, and upon men who were unworthy of this distinction. He and his colleagues then resigned, and organized the Pennsylvania College of Dental Surgery, he continuing dean. He resigned his connection with this school in 1857, and shortly removed to Baltimore, where he remained in active practice until near the time of his death.

At different times he wrote several small works upon dental subjects, viz.: "Popular Treatise on the Teeth," 1845; "Professional Patents" (about), 1850; "Treatment of Dental Caries Complicated with Disorders of the Dental Pulp;" "Translation of Delabarre's Second Dentition," 1854; "Treatment of the Dental Pulp;" "On the

Use of Adhesive Foil," 1857; "Nature and Treatment of Decay of the Teeth," 1867; "Treatment and Prevention of Decay of the Teeth," 1871 and 1879.

On account of his active interest in every step and improvement in his profession, he was a frequent contributor to its current literature, writing usually with force and clearness. His most marked articles were those in support of the position he defended in the treatise on "Dental Caries Complicated with Disorders of the Dental Pulp," in which he maintained that dental caries was not self-propagative, and that under certain circumstances it was allowable to permit a portion of caries to remain. His lectures were distinguished by excellent arrangement, energetic language, and simple logic, and will keep remembrance of him fresh in the minds of those who had the fortune to attend them.

Dr. Arthur's early experience was concurrent with those important movements in the dental profession which were at their climax at about the time when the first dental colleges were established. They had much influence upon him, and he became alive to the value of everything calculated to enhance the interests of dental surgery, or that might benefit the public by means of it.

His interest in the subject of dental education was constant and paramount, and it will be observed that his efforts towards improvement in that direction were unremitting. His views, however, were in advance of the general demands of the public, and ahead of the average sentiment of his fellows.

The subject which he made the principal work of the later years of his life was the "Prevention and Treatment of Decay of the Teeth," by peculiar methods of separating them. The principles underlying his methods and the manner of performance he advocated and practiced from 1862 until his death. So strong were his convictions of the value of this system that he pursued it unswervingly, notwithstanding it produced injurious results upon his pecuniary interests, on account of the prejudices excited against him by those opposed to his system of operating.

His most distinguishing moral characteristics were his strict integrity and conscientiousness, as it was impossible for him to admit, or even tacitly acquiesce in, any act that was tainted with the least suspicion of dishonor. He was naturally of gentle demeanor and of retiring disposition, but had the boldness and courage of the lion when aroused by any wrong, or when the public good seemed to him to require defense. His most marked mental qualities were the energy with which he held his views, and the full, clear, and concise terms in which he expressed them. His physical health was generally good, but his nervous tone frequently was reduced to zero by the

intensity of his mental action, combined with the exhaustive nature of his daily work; but for this his literary work had been greatly larger and even more conspicuous. It must be conceded that wherever the influence of dental literature has extended, the moral force and views of Dr. Arthur have commanded consideration and respect, and that his suggestions have modified the practice of dentistry to no inconsiderable degree.

From his early manhood he was a firm believer in what he considered the transcendent truths of the New Jerusalem Church.

The removal from this world of such a man is a great loss to his family, his friends, and his fraternity; but he becomes an example to the living, and has entered into a life where his character will find no impediments to its expression, and where he can reach an indefinite advancement.

L. J.

MELANCTHON ROGERS, M.D., D.D.S.

DIED, at Covington, Ky., June 21, 1880, of cholera morbus, Dr. MELANCTHON ROGERS, in the eighty-fourth year of his age.

Dr. ROGERS was at one time the leading dentist of the West, practicing for many years in Cincinnati, in which city he held a deservedly high rank. A half-century ago, while practicing medicine, he became interested in dentistry, and thereafter devoted himself to it as a specialty of medicine. He was the first professor of dental pathology and therapeutics in the Ohio College of Dental Surgery, and was interested in all movements looking towards the better organization and education of the profession and the advancement of its practice. He was highly esteemed as an upright man, faithful in all the relations of life. For the last ten years he has been in retirement, but remained in vigorous health until within a few days of his death.

DR. ELWOOD PENN WORRALL.

DIED, at West Chester, Pa., July 14, 1880, of enlargement of the liver, E. P. WORRALL, in the fifty-ninth year of his age.

Dr. WORRALL was born in Baltimore, in 1821; studied dentistry in Philadelphia, with Dr. Charles Foster; settled in West Chester, in 1847, and remained there until his death. He enjoyed a large and lucrative practice, and was held in affectionate esteem by a large circle of friends because of his kindly virtues, and his upright, earnest, and sincere life.

PERISCOPE.

IRREGULARITIES OF THE TEETH AND THEIR SURGICAL TREATMENT.
—Mr. Francis Fox read a paper on this subject, as follows: In bringing the subject of irregularity in the arrangement of the permanent teeth before you this evening, I do so more with a desire to excite discussion, and thereby to benefit from the remarks of others, than with the hope of being able to impart any knowledge of a special character. I shall endeavor, therefore, to regard the subject in its broad and general aspect, rather than to indicate any specific methods of treatment. Permit me, then, to occupy a short portion of your time in reviewing the chief physiological facts respecting the development of the teeth and jaws, as a prelude to the consideration of the abnormal circumstances which may occasion their deformity. The germs of the teeth are, as you well know, manifest at a very early period of embryonic existence,—those of the temporary series having been demonstrated at about six weeks after conception, and those of the permanent set some months before birth. I need not here dwell minutely on the various periods of development of the dental structures: how the enamel organ is formed by a dipping down of the epithelial layer of the membrane forming the jaws at this epoch; or how the dental organ, or papilla, consists of a projection of the submucous tissue; or how, about the sixteenth week of intra-uterine life, the temporary germs become inclosed in their membranous capsules, when calcification commences; or how, about this time, the germs of the permanent teeth are becoming developed by a reduplication of the oral mucous membrane from the necks of the temporary tooth-germs; or how the calcification of these teeth commences a little before birth. It will suffice that I remind you that the process of development is a very gradual one, and in neither case is it quite completed until some time after the teeth have assumed their ultimate position. We, therefore, at once perceive how liable they are to be affected by any untoward circumstances which may arise in the course of development and growth of the body. Without doubt the early decay of teeth, which so sadly marks the present generation, is due to mal-nutrition occurring in the earlier periods of life. At about seven months after birth a process of absorption is set up in the walls of the crypt and parts superimposed, and by this process the crowns of the temporary teeth become visible above the surface of the gums. When the crowns of the teeth are erupted, this absorptive action for a time ceases, and a renewal of the developmental process ensues, by which the alveoli are built up around the fangs of the teeth. At about four years of age the temporary dentition is perfected, and soon after this perfection is reached absorption again sets in, commencing now in the roots of the teeth, and these, together with their alveolar processes, are gradually removed, their permanent successors replacing them by a similar process of absorption of crypt and development of alveolar structures. The important point for us to bear in mind is the fact that the alveolar portion of the jaws is developed with each dentition, so that a previous alveolar structure can have little to do with the position of the succeeding teeth, except as it may

present an obstacle to their onward progress in consequence of its non-absorption. A few words as to the development of the jaw-bones. These bones consist of two portions,—(a) an alveolar structure, which we have just seen to be developed with the temporary teeth, absorbed with them, and again redeveloped with the permanent teeth; and (b) a basal portion. This base is more prominently marked in the lower jaw, in which the inferior dental canal very emphatically indicates the junction between the two portions of the bone. The base of the jaw when once formed remains in pretty much the same condition throughout life, except in advanced old age, when the muscles of mastication are no longer in full use, and then in a slight degree it becomes wasted. In the superior maxilla at birth the alveolar processes descend but little below the level of the palatal plates, and the anterior and posterior parts are but little developed. As age advances, the alveoli lengthen, and the tuberosities increase in size, and an active development of bone takes place in these situations. The tuberosities are to the upper maxilla what the coronoid processes are to the lower jaw. From these points the alveolar line is lengthened. In the lower jaw an alteration in the position of its articular surfaces and ascending rami, together with an absorption of the coronoid processes, accompanies the development of the posterior permanent teeth. The jaw elongates by additions to its posterior cornua. The capacity of the jaws in childhood is nearly equal to the anterior portions of the adult bones; for the ten anterior teeth of the permanent set in each jaw replace the temporary, and occupy the same position as these, so that this part of the jaw in adult life is pretty much the same as in childhood. If contracted then, it will remain so throughout life, and no subsequent development in the posterior regions will tend to expand it. The replacement of the temporary teeth by their successors is effected by a purely physiological process, and is absolutely independent of pressure. How the cells composing the absorbent papilla effect their work is not, I believe, very satisfactorily understood. There seems, however, to be a physiological law by which the cells in the neighborhood of a developing tissue have the power of absorbing a mature structure. That pressure has nothing to do with the process may be proved by the fact that in cases in which the shedding of the first teeth has taken place prematurely, a layer of bone has often been observed to intervene between the crown of the advancing tooth and the base of the socket of its predecessor. At the time when the temporary teeth are about to be shed, we notice in the well-developed jaw a decided separation between contiguous teeth; and this circumstance is a fair indication of a future regularity in the succeeding dentition, and a proof that this portion of the jaw has already been prepared to receive the larger permanent teeth. If the process of absorption continues uninterruptedly, the fangs of the temporary teeth will be gradually removed, leaving little more than the shells of the crowns, which readily drop from the gum as their successors are in turn ready to occupy their places. But should any arrest in this process occur (and such is far from an uncommon circumstance), these temporary organs are liable to offer very considerable obstacles to the regular advance of their permanent successors. The causes of irregularity in the position of the

teeth may arise during the developmental periods of life, and are then due to a want of proportion in the size of the teeth and jaws, or to a faulty development of the jaw-bones; or the displacement may depend upon some accidental circumstances arising subsequently, such as the prolonged retention of the temporary teeth, the presence of supernumerary teeth, the habit of "thumb-sucking," or the undue pressure from a hypertrophied tongue. There is abundant evidence to prove how frequently such deformity depends upon hereditary influences. The conditions of life to which our race has for so many generations been subjected seem to have lessened the necessity for the broad and well-formed jaws which were so characteristic of our ancestors, and for many years the advances in civilization have been marked by a deterioration in the capacity of our jaw-bones. Mr. Coleman, in some interesting investigations he made several years ago, found that the percentage of contracted jaws was immeasurably greater in the children of the well-bred population than in those of less refined cultivation. How constantly also do we find certain peculiarities in dentition, such as an absence of one or more of the dental series, occurring in the offspring of parents who have suffered the same defect, showing how strong an hereditary tendency there is to produce abnormalities. The prolonged retention of temporary teeth is frequently associated with irregularity in their successors, and is probably often the cause of such irregularity. The presence of supernumerary teeth in the dental arch may prevent the normal members from assuming their proper places; but doubtless a disproportion of size between the teeth and jaws is of all causes of irregularity the most common. This disparity leads to a crowding of the teeth, sometimes to such an extent as to altogether prevent the eruption of some one or other of the dental series, such remaining impacted in the substance of the jaws. Certain injuries in early life may occasion displacement of the teeth, especially in the lower maxilla, such as the contraction of cicatrices about the face and neck. Mr. Salter, in his work on "Dental Pathology and Surgery," treats the subject of irregularity of the teeth under two heads,—(a) simple irregularity, in which the misplacement is confined to one jaw, and is independent of the position of the teeth in the opposite jaw; (b) compound irregularity, which depends upon the position of the teeth in the opposing jaw. In "simple irregularity," that is, where the misplacement is confined to one jaw, the crown only of the tooth may be irregularly placed, the apex of the root retaining its normal position; or the entire tooth may be displaced or faulty in its development. Such irregular teeth are often entirely removed from the dental arch, and may be impacted in the substance of the jaw-bones. In the former condition, when the apex of the root retains its normal position, much good may be effected by judicious treatment, but in the latter case little can be done to remedy the evil except the removal of the displaced tooth. As examples of "simple irregularity" we may mention the appearance of the upper canines above the alveolar ridge, or in the palate, owing to insufficient room for them in the dental arch. An early loss of their temporary predecessors, by permitting the first bicuspid and the lateral incisor to approach each other, is not infrequently the immediate cause of this displacement. Sometimes, however, the undue

retention of the temporary canine, or the presence of a supernumerary tooth, will occasion the deformity. In treating these cases we must remember that nature will assist us greatly in the gradual development of the posterior portions of the jaw-bones; but it is often necessary to remove one or more of the posterior teeth before sufficient space can be obtained. Any obstructing temporary or supernumerary teeth should of course be removed; and if, after this proceeding, we have reason to think there will not be sufficient space for the permanent canine to come into its proper place in the dental arch, we must extract one of the posterior teeth. There is frequently some difficulty in determining which tooth shall be sacrificed, and, of course, if any are decayed, they should be selected; but, if all are sound, most authorities recommend the removal of the first permanent molars as being the teeth most liable to decay. But we should take into consideration the age of the patient, for, if the deformity has existed for some time, the removal of a bicuspid will more quickly remedy the evil. An overlapping of the incisors is another form of "simple irregularity," and frequently requires for its treatment similar surgical proceedings to those just described; but generally, after having obtained increased space in the dental arch, we must resort to some mechanical appliance in order to obtain regularity in the position of these teeth. Another not uncommon form of irregularity is where an incisor tooth is more or less twisted, sometimes to such a degree that the side of the crown will occupy the position of its anterior surface. A forcible twisting of the tooth into its right position is very generally adopted, and this mode of treatment has a powerful advocate in Mr. Tomes. He suggests that, when the displacement is very great, the operation of twisting should be gradually performed, a limited movement being made at intervals, in order that the alveolar process may the better accommodate itself to the new position of the tooth. Others are averse to this prompt treatment, and suggest the employment of a plate carefully adjusted to the palate, and having certain properly constructed points of resistance. To this mode of treatment I think Mr. Salter most emphatically inclines. An unsightly separation of the central incisors in the upper jaw sometimes occurs, and the teeth may be readily drawn together, but they have a great tendency to return to their former position. In treating these cases great care should be taken to prevent the ligature from slipping below the edge of the gum,—between the necks of the teeth and the gum,—for the irritation set up by such a mishap has been known to cause the death of the tooth. In order to prevent this displacement of the ligature, a small vulcanite plate may be constructed, to which the ligature can be attached, and thus prevented from shifting its position. A few words upon the second form of irregularity of the teeth,—that depending upon the position of the teeth in the opposing jaw. This is much more complicated, and as an example we may cite the "under-hung jaw," in which the "bite" is intersecting; some or all of the six front upper teeth being shut behind the corresponding teeth in the lower jaw. This condition, in its extreme extent, arises in consequence of an undue development of the lower over the upper jaw, or of a want of development in the superior maxillary bones. It may also arise from a retardation in the eruption of the superior

incisors, or by these teeth being pushed inwards by the prolonged occupation of the dental arch by their temporary predecessors. An early treatment of this irregularity is all-important, and should consist in preventing the contact of the opposing teeth. This can be insured by the adaptation of a plate to the palate, and covering the posterior teeth so as to prevent the anterior teeth from coming in contact. It may be necessary also to push outward the in-standing upper incisors. An opposite condition of the lower jaw sometimes occurs, in which the lower incisor teeth bite close up to the palate, so that they press against the necks of the upper teeth and push them forward. This condition is liable to arise when the sixth-year molars are lost before the second permanent molars have erupted sufficiently to form the necessary "prop," in order to prevent an undue closure at the anterior parts of the jaws. A separation of the teeth in the anterior portions of the jaws has been described, and is occasioned by a congenital malformation of the lower jaw. The early obliquity in position of the ascending rami is unduly maintained, and there is a want of development in the alveolar portions of the jaws, especially in the regions of the molar teeth, so that these came into contact before the incisors. This irregularity may be caused by the contraction of a cicatrix in the throat or neck. A remarkable example of this deformity is mentioned by Mr. Tomes. The bicuspid teeth are not infrequently displaced, and when so they usually occupy a too inward position. This may arise solely from their having been prevented from assuming their proper position in the dental arch by the prolonged retention of the temporary molars. But usually it is dependent upon a diminished capacity of the jaw, and in the upper jaw generally associated with a projection of the incisors, and a more or less elevation of the palate, constituting the V-shaped jaw, or "rabbit-mouth." This malformation is congenital, but, except in very exaggerated cases, is not very manifest until the posterior permanent teeth are about to be erupted, when the additions to the superior maxilla have been made in the posterior regions. The newly-formed bone, which has been gradually developing, is now found to be placed at an angle with the pre-existing alveolar line. This abnormal development has arisen in order to effect an harmonious arrangement with the other bones of the cranium. The maxillary bones having been imperfectly developed during early childhood, their posterior borders not being sufficiently divergent, the subsequent additions for adult conformation are placed in a wider circle, hence the point of junction between the two parts (the old and the new, so to speak) is marked by an angle of more or less extent. It is usually associated with great delicacy of constitution, and may occur in those of weak mental powers, but is often observed in persons of great intellectual capacity. The treatment of these cases consists in endeavoring to gain increased space in the dental arch, and to diminish the projection of the upper front teeth, but is, as a rule, more or less unsatisfactory. Irregularity in the wisdom-teeth is sometimes met with, and may occasion most serious mischief, when extraction is the remedy. Transposition of the teeth is rare, and is usually met with anteriorly; and also inversion, which is still rarer. In considering the general treatment, I have wished to confine my remarks to the surgical proceedings calculated to

benefit, and have, therefore, not dwelt on the mechanical part. The timely extraction of the temporary teeth I believe to be of great importance, as their prolonged retention is the frequent cause of irregularity. In cases of advanced irregularity it is often necessary to sacrifice one or more of the permanent set, and then the choice would generally fall upon the first permanent molars, but under certain circumstances upon the bicuspid. — *Proceedings of Association of Surgeons practicing Dental Surgery, in Medical Times and Gazette.*

SUDDEN AND TRANSIENT SWELLINGS OF THE LIPS.*—The affection which is the subject of this communication is in itself, I must confess, rather a trivial one. Certain considerations will, however, I trust, suffice to show that it is not altogether devoid of interest to the practitioner and to the student. In the first place, without being really rare, it is sufficiently uncommon to have escaped the observation of many experienced physicians. In the second place, it has not obtained, so far as I have been able to learn, any distinct recognition in medical literature; it has no nosological position; in a word, no name. Hence the necessity of the descriptive, symptomatic designation which serves as the title of my paper. Finally, although invariably of short duration and favorable termination, this little disturbance, by the suddenness of its onset and by the inconvenience and deformity which it occasions, is apt to cause a considerable degree of alarm to the patient. It then becomes very desirable that the physician, when consulted, should be able to recognize at once the nature and harmlessness of the trouble, if only for the sake of reassuring the patient. Relying, then, upon these features of interest, I venture to occupy the attention of the Society this evening upon this nondescript and nameless ailment.

The affection which I propose briefly to describe presents for consideration in most cases but one symptom, namely, a sudden and transient, circumscribed, painless swelling of the lip. The onset seems to take place mostly in the night, for nearly all the patients whom I have seen, numbering from twelve to fifteen cases, had first become aware of the existence of the trouble in the morning on awaking. The swelling would then be already fully developed and very considerable, or it might be moderate in degree, and continue for a few hours to increase. All my cases have occurred among the poor, in dispensary or hospital out-patients, in Paris and in this city. The swelling was in most cases very great, occupying the entire upper lip, or the lower lip, or the commissure and the greater part of both upper and lower lips, and gradually fading away, without distinct limit, upon the cheek. The lip so affected is enlarged in every way, greatly thickened, and elongated. Its consistence is quite hard and firm. There is little or no tenderness, and pressure does not cause pitting. The swollen lip stands stiffly out, and remains quite motionless when attempts to shut the mouth or to speak are made. As consequences of this state of things there is a very marked degree of deformity, rendering the sufferer at once hideous and ridiculous. A good deal of inconvenience also exists, resulting from the stiffness of the protruding lip, and the

* Read before the Boston Society for Medical Improvement, April 26, 1880.

consequent inability of the patient to effect the usual movements of the part. Articulation is thus rendered indistinct, drinking is made difficult, and even the act of swallowing may be hindered, on account of the impossibility of making the necessary vacuum within the mouth. Another uncomfortable result is a continual overflow of saliva. In most cases nothing more is discovered on examination. The patient is alarmed by the suddenness of the attack and by the conspicuous character of the deformity, and he complains only of the feeling of clumsiness, tension, and rigidity of the swollen part, and of the inconveniences resulting from its displacement and immobility. In a few cases, however, there are some additional manifestations. There may be a little pain and tenderness and a trifling degree of redness of the integument; also some increase of warmth. In a word, the characteristic elements of inflammation are present: heat, redness, pain, and swelling. The latter, however, greatly preponderates, and generally constitutes the whole disease.

The trouble from the first and throughout remains purely local in character, and confined to the part in which it originated. I have never seen any sign of general disturbance such as fever, indigestion, or sickness of any kind. Neither have I observed any complication or sequel. Adenitis, in particular, has always been absent. The course of the affection seems to be invariably the same. The swelling, having attained its fullest development in a few hours, persists for a day or two, and then gradually subsides, disappearing wholly within a total duration of twenty-four, thirty-six, or forty-eight hours. . . .

With regard to the circumstances which might throw light upon the *etiology* of this affection, I would say, first, that *sex* and *age* play no part in its causation, for I have seen it in children and grown-up people, both male and female. *Season*, however, does seem to exert a distinct influence, if I may trust my own experience. All the cases that I have seen have occurred in the spring or summer months. I have often interrogated patients with a view to discovering some accidental circumstance which might supply a plausible determining cause for the attack. In a few cases exposure to cold, such as might result from the neighborhood of an open window, was incriminated, but the evidence in favor of this agency was generally uncertain. The state of the teeth I have always carefully examined, without finding any connection between the attacks of lip-swelling and the existence of caries, alveolar periostitis, or gingivitis. In no instance was toothache complained of, and in some cases the condition of the teeth was faultless. Several patients have attributed the attack of swelling to the bite of a spider, but upon questioning them with care this agency turned out to be purely imaginary. . . .

The *diagnosis* of this ailment is readily made, provided only that the practitioner is forewarned of the existence of such an affection. The absence of any disturbance except the swelling itself suffices to set aside the existence of erysipelas, furunculus, or urticaria. The sudden onset and the rapid subsidence of the swelling are incompatible with the idea of a scrofulous enlargement of the lip. The acute gouty swellings of Graves, Draper, and Milton seem to be so similar to the affection which we are considering as to be probably undistinguishable from it, save by the frequent repetition of the process, and by the evidences of constitutional disturbance. They are, however, very rarely seen,

and may, perhaps, be considered as highly aggravated and exceptional forms of the same disease.

The *prognosis*, it is hardly necessary to add, is invariably favorable, since the swellings may be expected to disappear spontaneously in a few hours, or at the latest in a day or two. No treatment, except, perhaps, the avoidance of exposure to cold, seems to be called for. The sufferer may prefer to keep the house till the very unsightly deformity has subsided. The most important office of the physician consists in dispelling the needless alarm of the patient. That he may be able to render this little service he must be prepared to recognize the affection and to foretell its issue. The object of my remarks upon the subject of ephemeral swellings has been mainly to impart the familiarity which breeds contempt.—*T. B. Curtis, M.D., in Boston Medical and Surgical Journal.*

TREATMENT OF RANULA.—Dr. C. Lovegrove (Hythe) has found the following plan most efficacious: Pass a tenaculum through the base of the tumor, and draw the part somewhat forward. After withdrawing the thicker part of the tenaculum a little, pass a plain gold ring, such as is used when the ears are first pierced, by the side of the tenaculum through both holes; then clasp it securely, and leave *in situ* for three or four weeks, then remove. A permanent exit for the mucus, etc., will then remain, and all trouble will cease.

J. E. G. has found the following plan very successful on several occasions: Thread an ordinary curved needle with common silk suture; make a double thread; pass the needle through the cyst, tie the thread sufficiently short, so that the loop lies within the teeth and will not be bitten through when eating; move the thread to and fro every other day. If this be kept in for about a week, the cyst will have evacuated itself by means of this small seton. When the patient says that it no longer discharges, remove the thread (seton), and let it granulate up. The last case he treated in this way (about six months ago) is still quite free from the ranula. Since that case he had another ranula, in an old woman about seventy; it involved the whole extent of her toothless lower jaw, and pushed her tongue up against the roof of her mouth; she could not speak or swallow. The treatment adopted in this case was to make several punctures, at least half a dozen, through the cyst with a sharp-pointed bistoury. He gave a concentrated solution of chlorate of potash as a lotion to wash the mouth with, and also gave her a mixture of chlorate of potash. This case is still relieved by the above treatment.

Dr. C. D. F. Phillips recommends gradual dilatation of the salivary duct by laminaria tents. After incising and clearing out the ranula, the duct should be sought for and a piece of laminaria (which may require to be as fine as a needle, and should be very smooth) be inserted as far as possible, and left in for one or two hours every morning and evening. The size of the tent should be increased but very gradually, so as to avoid over-much irritation. The patient himself can learn to pass it after a little instruction, and cure should result in two or three weeks. In some cases it may be necessary to leave in the tent longer, and then a perforated one should be used. Some years ago, Dr. Phillips came across several cases in which the duct, as well as the ranula, had been cut away, and much suffering and

serious swelling of the gland had resulted. These cases were cured by simple incision and keeping open the artificial duct by laminaria.

Mr. W. J. Tivy suggests the use of a seton composed of three or four threads of coarse ligature silk, which he has found invariably successful.—*British Medical Journal*.

COMPARATIVE ANATOMY OF THE TEETH IN MAN: THE RACES OF AFRICA.— . . . The teeth are regular, well developed, and generally free from caries. The third molars, or wisdom-teeth, appear to be always in their places before the closure of the basilar suture, whereas among civilized races they are often much later in coming into place. The size of the teeth varies in different races; but hitherto no accurate measurements have been made to express this difference. The length of the molar series in a straight line between the anterior edge of the first pre-molar and the posterior edge of the third molar may be conveniently used to indicate the size of the teeth, and called *d*. This may be compared with the length of the cranio-facial axis or basi-nasal length BN, and a dental index formed from $\frac{d \times 100}{BN}$. This will give, at all events, a fair approximation to the relative size of the teeth, compared with the skull, as the length BN is one of the least liable to variation of any in the cranium. Unfortunately for this investigation, in a large proportion of the crania in museums the teeth are wholly or partially lost, and a larger number of specimens must be measured than are at present available. The following indices (which must be regarded as provisional) are, however, of considerable interest. In the first place, it must be observed that the teeth of women, though smaller absolutely than those of men, are relatively larger to the cranio-facial axis. For instance, in Europeans, the dental index of males is 40.5; of females, 42.0. In Australians the disproportion is greater still, being 45.7 for the males, and 48.4 for the females examined. In the following table males only will be included: Europeans, 40.5; ancient Egyptians, 40.8; Hindoos, 41.2; American Indians, 42.5; Chinese, 43.8; African negroes, 43.9; Andamanese, 44.2; Fijians, 45.4; Australians, 45.7. It will thus be seen that in the size of the molar teeth, the negroes hold an intermediate position between Europeans and Australians, but approaching nearer the latter. The actual average length of the molar series in European males is 40.8 millimeters; in Africans, 45.4 millimeters; in Australians, 46.7. The anthropoid apes give a higher index than that of any of the races of man.—*Prof. Flowers, before the Royal College of Surgeons of England; British Medical Journal*.

CANCERUM ORIS.—Mr. Cripps exhibited a sequestrum consisting of nearly the whole of the lower jaw from a case of cancerum oris. A child two years old was admitted into St. Bartholomew's Hospital under Mr. Savory's care, with a history of having been perfectly well till a fortnight previously, when she was attacked with fever, loss of appetite, and a swelling over the right side of the jaw, which at the time of admission extended from the last molar to the canine tooth; a week later this swelling had involved the whole of the lower jaw. The swelling was hard and very defined; ulceration set in in the older part, and then after an interval the whole of the involved soft tissues sloughed, and the child died. The sequestrum was re-

moved from the slough at the post-mortem; it was then found that the disease had begun to involve the upper jaw also. The case differed from cancrum oris in some particulars, especially in its slow course. Subsequently it was ascertained that a favorite cat with which the child had been playing had suffered from swelling of the nose and mouth, with fetid discharge, for which it was killed. Hamilton described the disease a century ago, and since his time little, if anything, had been added to our knowledge of the affection. Mr. Morrant Baker had seen the case during life; although it was more like cancrum oris than anything else, it certainly did not present the usual features of this affection. He thought it fairly probable that it might be a special disease. Dr. Thin asked if the child had taken mercury at any time. The president remarked that it was quite unusual for cancrum oris to affect the bone so extensively; had the child been exposed to the fumes of phosphorus? Dr. Dowse inquired if the child had had measles, for he had had several cases of cancrum oris as a sequel to measles; in one instance he had three patients in one house, all of whom, soon after recovering from measles, had extensive necrosis of the lower jaw; two of them died. The disease in these cases seemed to begin in the alveolar process. Mr. C. Macnamara considered it to have been a case of acute necrosis of the jaw from periostitis, such as is often seen in the extremities of young children, and that it could hardly be called cancrum oris. Dr. Sharkey had seen a case of cancrum oris in St. Bartholomew's Hospital following measles, in which the right half of the necrosed jaw came away, and the patient recovered. The president, in calling on Mr. Cripps to reply, remarked that the Society had only seen the sequestrum, while Mr. Cripps had seen the whole course of the case. Mr. Cripps stated that there was no history of mercury, phosphorus, or measles, and he could not agree to consider it acute necrosis, for it began first at one part, then slowly spread, and later on again spread and reached the upper jaw; the necrosis was secondary to the sloughing of the soft parts.—*Reports Pathological Society of London, in the Lancet.*

BORACIC ACID IN INFLAMMATION OF MUCOUS MEMBRANES.—In this era of antiseptic medicine and surgery, it is rather surprising that, while carbolic acid is universally known and extensively used, boracic acid, an agent in every way superior, remains in comparative obscurity. Says Bartholow: "Boracic acid appears to be as effective as carbolic acid, and is even less irritating to the tissues than salicylic acid. A saturated solution may be employed as a dressing to fresh wounds to prevent the action of atmospheric germs, or to arrest decomposition in gangrenous, sloughing, or ill-conditioned wounds." He recommends its application to wounds, ulcers, burns, scalds, eczema, pruritus, etc., and closes his notice of this agent by saying: "Boracic acid may be employed in all the various forms and combinations in which carbolic and salicylic acids are now used by the antiseptic method." Prof. Stillé, in the National Dispensatory, refers to the investigations of Polli, who demonstrated that boracic acid possessed remarkable antifermentative powers. He experimented with beer, milk, urine, eggs, blood, and meat, and found that these substances, when mixed with the acid, would keep fresh for thirty days in hot weather. He then made a clinical test in cases of chronic cystitis, administering seventy-five grains of the acid daily, and found that,

after a very few days, the muco-purulent deposit disappeared from the urine. Neumann, of Vienna, has used boracic acid with success in the treatment of urticaria, pruritus, eczema, and other parasitic skin diseases. Prof. Seely, of the Medical College of Ohio, has for some time treated cases of acute and chronic middle-ear inflammations and of purulent conjunctivitis by means of boracic acid, with excellent results. Prof. W. H. Davis, in vol. x. of the *Chicago Medical Times*, p. 569, gives this agent a most favorable notice in the treatment of old chronic ulcers. Since the publication of that article, he has used boracic acid extensively in private practice and at the college clinics, as an antiseptic dressing and as a topical application to inflamed mucous membranes, with great success. Boracic acid has been in use for a considerable time as an antiseptic dressing, but as an application in the treatment of diseased mucous membranes, and especially in gonorrhœa, it has only recently come into notice. . . . To these reports, culled from different sources, I wish to add my own experience with boracic acid as an application to inflamed mucous membranes. In nasal catarrhs it has afforded me more satisfaction than any other one agent. The secretions from the diseased surfaces are first dissolved and washed away by means of some alkaline solution, and then a solution of boracic acid (gr. v to viii, to water 3i) is applied two or three times a day with an atomizer. So far almost immediate improvement has followed this method of treatment. . . .

Although the experience with regard to the remedy is too limited and short to establish conclusions, yet it seems probable that boracic acid is eminently adapted to the treatment of certain diseased conditions of mucous membranes.—*W. K. Harrison, M.D., in Chicago Medical Times.*

HYSTERICAL TOOTHACHE.—Miss J., a young lady aged nineteen, came complaining of toothache in the second lower molar on the right side. On examination, it was found to be very much decayed; and, as it was very sensitive to pressure, showing some inflammation of the peridental membrane, and as there was not room for the dens sapientiæ, it was extracted under nitrous-oxide gas; and the patient was told to come again to have some teeth filled that were decayed. When she came, pain was complained of in the first molar next to the one extracted. This was excavated ready for filling, and some carbolic dressing put into the cavity. The pain continued, and the tooth was sensitive in the same way as the other; she could not eat on it, and the slightest touch of an instrument even on the healthy surface of the tooth was felt. The pain was constant, day and night, and of a dull, heavy character. The patient wished very much that the tooth might be removed. The gums were ordered to be painted with a solution of tincture of iodine and tincture of aconite. A calomel and opium pill was given at night, and a general tonic was prescribed. The pain, however, continued; nothing gave relief. At this time, my suspicion was aroused; and, pretending to tap with an instrument a tooth in the upper jaw, I really did so to the bottom one, but no pain was felt in either tooth. This I repeated several times, always with the same result. I felt convinced that the pain was entirely hysterical, and, on inquiry, found from her relatives that she was a very hysterical subject, and had been under treatment

for hysteria about a year ago. Miss J. is a full-grown, well-developed woman, and of a peculiar lethargic, unenergetic disposition, and rather anæmic, but, on the whole, enjoying good health. She is regular in all habits, and the catamenial periods are regular. This is the second case of the kind that has occurred in my practice; the other is much like this.—*Morton Smale, M.R.C.S., in British Medical Journal.*

REMARKS UPON CHLOROFORM.—In regard to the administration of the anæsthetic, you should not forget that *chloroform should never be given with the patient in an erect, or even in a semi-recumbent posture.* Owing to the tendency to syncope and heart-failure, the head should not even be raised from the pillow, nor the neck bent. Of course you would not give chloroform nor any anæsthetic immediately after a full meal, on account of the danger of incomplete vomiting and strangulation. *No food should be given for at least four hours before the administration of chloroform.* The assistant in charge of the anæsthetic should devote his entire attention to watching its effects upon the patient, and should not look at what the surgeon is doing. The administration must not be hurried; *chloroform must not be crowded, but given deliberately and with plenty of atmospheric air.* In regard to the amount necessary to be used, in the case of an infant you have noticed that only a few drops are placed upon the center of a folded towel, in the manner in which you have frequently seen it done by my experienced assistant, Dr. Hearn; for an adult the amount may be increased to half a drachm at first, to which a few drops are added from time to time to supply the loss by evaporation. *The clothing must be loose about the chest and the abdomen during the administration.* Should a change be noticed in the pulse or appearance of the patient, the chloroform must be at once removed and the patient turned upon his side, the tongue drawn forwards and the face dashed with cold water, and the chest, or, in the case of a child, the nates, well whipped with a fringed towel wet with ice-water. If the patient do not revive, the foot of the table may be elevated so as to allow the head to hang down, or the patient may be lifted by the heels, or “inverted,” while artificial respiration is attempted. The vapor of nitrite of amyl, or spirits of ammonia, may be cautiously given, which sometimes has a remarkable effect. . . .

Chloroform should be administered with especial care to habitual drinkers, and to those who are the subjects of heart- or kidney-disease. It seems to be particularly applicable to young and middle-aged persons. In strong adults it occasionally happens that we cannot make them unconscious with ether, and we are obliged to give them a small amount of chloroform in addition.

Although chloroform does not commonly cause vomiting, and is much more pleasant and efficient than ether, I do not now use it as frequently as formerly, but have yielded my preference in deference to popular opinion, which at present holds the surgeon responsible if any accident should happen. I therefore employ the safer but less agreeable agent to a very great extent as a substitute for the chloroform.—*Clinic of Professor Gross, at Jefferson Hospital, in the College and Clinical Record.*

ANÆSTHETICS: THEIR POSITION AND PROSPECTS.—Death under anæsthetics is of course the great and important fact connected with

their use. The event is so shocking and painful to all concerned, the reverse is so dark where without this all is so brilliant that its occurrence has from the first excited the deepest interest, and stimulated the most scrutinizing investigation and closest study. It is safe to say that it will continue to do so until we shall have attained the solid basis of assured knowledge. . . .

Our task has been executed during a period of greatly renewed interest in and study of anæsthetics. In regard to some the ink has scarcely dried before new facts were presented for consideration or statements had to be modified. This awakened interest in the subject and this rapid investigation of new agents attest at once the great importance of the subject and the earnest desire of the profession for a pleasant anæsthetic safer than any we now have. Such an one is not yet found. Every one must deeply regret that a death should have occurred to shake confidence in an article which promised a realization of our hopes. Yet when we reflect on the number of successful inhalations necessary to prove that a new anæsthetic is better than those already tried, the difficulty of the problem is appreciated,—the new candidate must have been used thousands of times before it can rival chloroform or the mixed vapors, and tens of thousands before it can be compared with ether in regard to safety. Were this fact kept in view, there would be fewer journal articles and less dogmatism upon this class of remedies. Is it probable that a perfectly safe anæsthetic will ever be at our command? The time necessary for the proving of new agents makes this very improbable during the lifetime of those who saw the advent of ether and chloroform, and the retrospect we have made is not favorable to an affirmative answer. Disaster has followed the use of all, and the facts now will sustain Velpeau's statement as well as when he made it, and still justify Erichsen's words: "With every possible care it appears certain that the inhalation of any anæsthetic agent is in some cases almost inevitably fatal." The inference is that what has been so universally true in the past will be true in the future, however sad this may be to the philanthropist or to the enthusiastic surgeon. Unfortunately, physiology teaches the same lesson,—a state of artificial anæsthesia is a state on the borders of death.

The great practical lesson of all facts and all theory is that in the use of anæsthetics no precaution can be superfluous, no care too minute, and no watchfulness too great.—*Review by J. C. R., in the American Journal of the Medical Sciences.*

THE SAFETY OF ANÆSTHETIC AGENTS.—The occurrence of a death recently at the Jefferson College Hospital, under the influence of ethyl bromide, calls professional attention very pointedly to a fact that was strongly urged against the introduction of anæsthetics in general a quarter of a century ago, and that has apparently been largely lost sight of since they have triumphantly silenced opposition and their use has become general. It is this: Coma produced by ether (ethyl oxide) is probably the least serious of any known form of profound suspension of the cerebral functions; but coma, however produced, cannot be regarded as entirely free from danger; under all circumstances it is a grave symptom of disturbed cerebral circulation. That it may be and usually is completely recovered from is true; but, to the physiologist, it is a rude interference with great functions, that

should never be looked upon with indifference, nor without some anxiety.

Let it be understood that there is no such thing as a perfectly safe anæsthetic. If a dog can be killed with ether, or any other agent, we may be satisfied without further demonstration that a human life can also be sacrificed, if the dose be relatively increased. More especially is there danger of a fatal result if one or more of the principal organs, such as the brain, heart, lungs, or kidneys, are seriously diseased, and barely able to carry on their functions under ordinary circumstances. Such accidents have unfortunately happened. What then is the lesson? Clearly that anæsthetics should be given with circumspection, never unless abundant reason exist, and only then when in the hands of persons especially trained and fully aware of the responsibilities of the position in which they are placed.—*Editorial in College and Clinical Record.*

BROMIDE OF ETHYL.—The death of a patient under this anæsthetic at the Jefferson Medical College Hospital will, we suppose, lead to the general recognition of the fact which we have before insisted upon, that it is a dangerous agent. The patient was about to be operated upon for stone in the bladder, but expired as the first incision was being made. As the production of anæsthesia was supervised by Dr. Levis himself, it is hardly probable that any valid excuse can or will be offered. Professor Pancoast informs us that he recently saw another case nearly die from the bromide: so that, while we can admire the enterprise and courage of the surgeons who have so heartily advocated the use of this substance, we think that they will agree with us that enough has been done for honor's sake, that neither science nor art demands more, and that further experiments will require justification.—*Editorial in Philadelphia Medical Times.*

PERIODONTAL DEPOSIT OF MERCURY.—Mr. H. L. Jacob (Birkenhead) related the following case: On March 21, 1868, he extracted for M. W. G., aged about thirty-five, the right upper wisdom-tooth, which was carious, loose, and painful. On examination he found the sac of an old abscess round the tooth, and the substance of the thickened fungoid periodontal membrane was studded with globules of mercury, of various sizes, from a diameter of one-twenty-fourth of an inch downwards; some being too small to be seen distinctly with the naked eye. The patient stated that the tooth, to his recollection, had never been filled; and that, to the best of his knowledge, he had never been subjected to a course of mercury.—*Proceedings of Association of Surgeons practicing Dental Surgery, in British Medical Journal.*

IS SALICYLIC ACID INJURIOUS TO THE TEETH?—The *Journal of Materia Medica* for April, 1880, observes that salicylic acid, now so much in use as a dentifrice, is found, by Dr. Buch, of St. Petersburg, to be a solvent, and exceedingly injurious. Dr. Buch states that he was in the habit of using a solution of three parts in one thousand of salicylic acid, a lotion of such strength being fatal to bacteria; in a few weeks, however, he experienced a singular sensation in his mouth; the teeth appeared to become softer, and on the surface something gritty was detected, there being evidently a granular formation.

Dr. Buch's conclusion is that the substance in question is a salicy-

late of lime, and, if so, the use of the acid as a dentifrice should be discontinued.—*Medical and Surgical Reporter*.

MAGITOT ON DENTINE.—At a recent meeting of the Paris Academy of Science, M. G. Magitot reminded his hearers that, in accordance with the views of Professor Owen, the tissue which enters into the essential part of the teeth of the majority of animals has hitherto been known under the name of dentinal tissue or dentine, and the structure of this tissue has been considered to consist of homogeneous fundamental substance, traversed everywhere by canaliculi. M. Magitot, however, has been led to consider the dentine rather as a fibrillar tissue included in a hard and homogeneous mass, in which the canaliculated structure cannot be recognized. The bony tissue itself, occupied, as we know, by ramified cells, can no longer be looked on as furrowed by cavities and canals. The developmental facts of dentinal tissue also support these anatomical views.—*British Medical Journal*.

HINTS AND QUERIES.

"He that questioneth much shall learn much."—BACON.

CORRESPONDENTS desiring a reply in this department are requested to make use of *distinctive signatures or initials*, and avoid the practice of signing their communications Reader, Subscriber, etc.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names. We cannot insert queries or replies except they are so accompanied. Names not necessarily for publication.

I. T. E. asks, in June DENTAL COSMOS, the easiest method of removing tin foil from dental plates after vulcanizing. I use heavy tin foil, say No. 10 to No. 20, on a properly prepared cast, and open the vulcanizer as soon as it is well cooled off, remove the plaster from the plate, and wash with clear water and stiff brush, remove metallic air-chamber form, and, with a small, round-pointed scraper, remove the tin foil, which readily peels off. If thinner foil is used, it is more easily removed by the action of nitro-muriatic acid, in which the plate is immersed for fifteen minutes. The use of thick tin foil, if laid on smoothly, is no objection in regard to fit of plate.—A. LAWRENCE, M.D.

ANSWER TO I. T. E.—The readiest method to remove the tin foil after vulcanizing is to use a medium-sized tin, say No. 8; and to silex the model before putting the tin on (care should be taken not to silex the air-chamber, for it will discolor the rubber); then rub a little soapstone all over the tin on the model with a tuft of cotton, and the tin will peel off from the plate after it is taken out of the flask.—WM. MÜLLER.

I WOULD say to I. T. E., that if he will give the tin-covered model a coating of collodion and allow it to dry before closing the flask, he can remove the tin without trouble either from a vulcanite or celluloid plate. Soapstone the cast for celluloid. Use nothing but collodion on the cast for a rubber plate, and you will be better pleased than with tin foil. Painting on several coats of the collodion is more satisfactory than a single coat.—CABOT.

G. A. F. asks, "What are the advantages and disadvantages of immediate replacement (of artificial teeth after extraction) or of prolonged waiting?"

The disadvantage of a too early replacement is that absorption of the gums and processes will continue for some months after the loss of the teeth, so modifying the form of the parts that a second plate will be likely to be required. The disadvantages in waiting for the absorptive process to be completed are that the patient is while thus waiting unable to masticate the food properly, and the result is dyspepsia, if nothing worse; that any remaining teeth are liable to elongate or become irregular from want of occlusion with, or of support from, the opposing or adjoining teeth. Another and very serious disadvantage is that after the loss of the teeth the muscles of expression, as well as of mastication, lose their natural action, and become so modified, to suit the new order of things, that it is thenceforth impossible to regain the "natural look," and to this reason is to be ascribed much of the dissatisfaction which the friends of patients express with reference to new dentures.—M. E.

G. A. F. asks to be informed of the best remedy for soreness of the gums after extraction.

Tincture of arnica, largely diluted, is efficient; tincture of calendula, diluted, is also an excellent remedy; but perhaps no other agent is so efficacious in preventing or removing soreness of the gums as *phénol sodique*. It causes the rapid absorption of the extravasated blood, thereby preventing fetor of the breath, and facilitates the speedy closing, healing, and hardening of the gums. A dessert-spoonful to a goblet of water, used frequently, will give admirable results.—S. M.

DARK JOINTS.—The contributors of excellent hints as preventive of this provoking trouble overlook one great cause of dark joints,—the spreading apart of the blocks in the flask. Gum teeth, even though carefully jointed, are liable to spread apart, particularly if the plaster and water in mixing are not well proportioned. Too rapid closing of the flask together after packing will also cause spreading. I *seldom* have dark joints, and my method is as follows: I make the joints as perfect as possible, and before waxing to the base-plate I bevel the inner edge of the joint just a little, and am careful to keep the joint proper free from wax. After waxing up and making the first imbed, I select a piece of clock-spring (the temper having been drawn from the ends) approximating the shape of the outer gum curve of the case, and, after pouring in a little plaster in the last half, I set this spring close to the blocks and finish pouring. Shaking the flask well together, I warm the flask just enough to soften the wax in taking apart, and, after getting out all the wax I can with an old excavator, I set the sections of the flask up edgewise and pour over them enough boiling water to perfectly clear them of wax. I work dead plaster into each joint, and fill flush with oxychloride of zinc, and, by taking plenty of time in heating and bringing the flask together, I avoid any disturbance of the blocks or of the gum cement.—CABOT.

DURING the past few months many methods have been given to prevent black joints. I prefer G. Hardcastle's method (see *DENTAL COSMOS* for June), yet he neglects to call attention to the filling of the joints on the inside after the wax is removed. The best way to accomplish this is to use the blades of a pocket-knife to work the plaster in. I find this the best method for rapid and consistent work. I have adopted this plan for years, and in only one in a hundred cases have I failed.—WILLIAM A. MILLS, D.D.S.

I HAVE a very perplexing case, that of constructing an upper denture for a gentleman of about forty-five, whose teeth have been extracted some two years. He has his lower front teeth as far back as and including the first bicuspid of each side; also one wisdom-tooth below. His mouth is of ordinary size, with very

fairly developed alveolar borders and condyles, but nowhere are they so shaped that the plate can lock upon them in the manner of an undercut, and so prevent dropping; but, on the contrary, looking at the palatal surface, the whole depression for condyles and alveolar border presents an open U-shape. The palatal arch of the mouth is rather shallow, and wholly covered by a very thick, spongy membrane, except one little hard ridge upon the median line, extending from the alveolar border a half-inch or so into the arch, where it loses itself in the deep sea of mucous membrane. The difficulty is to secure sufficient suction to hold the plate in position. I have made *three* different plates, deepening, enlarging, and altering the air-chamber so as to prevent its bearing upon the hard ridge; have constructed a high ridge around the air-chamber, and another across the posterior part of the plate, to become imbedded in the soft membrane and prevent leakage of air; have also made plumpers upon which the muscles of the cheek may act as an additional help to hold, but none, nor all combined, are scarcely an improvement upon the first plate made. The adaptation and articulation seem to be perfect, with no irritation whatever. I have used celluloid in each case, which seems in no way objectionable in the mouth. To all appearance {there seemed to be no reason why I might not readily have made a very satisfactory and useful denture, and surprise at my repeated failures is so great that I present the case, hoping that some one who may have passed through a similar experience may instruct me, or for useful hints or suggestions from any one of the many readers of the DENTAL COSMOS. Is it possible that a metal plate of any kind could offer better chances of success?—W. P. G.

A CASE OF ORAL POLYPUS.—I have removed from the mouth of a lady patient during this month a tumor situated on the right inferior maxilla, occupying the position of the mylo-hyoideus, and extending from the inferior dental foramen to the central incisor, the length of which at the commencement of the operation was six centimeters, and the circumference at the middle seven centimeters. In this case I used five ligatures made from caoutchouc bands. These I prefer for their continued action. I inserted the curved needle, threaded with the band from within outwards.

I consider the exciting cause of the polypus (which had been growing for two years) to be the rough edge of a badly-fitting lower denture.—J. CALDER, D.D.S., Victoria, B. C.

ONE of your exchanges recommends the use of white of egg instead of soap for the removal of plaster of Paris from the hands. I think I can call attention to something which is far better,—that is, Colgate's "Cashmere Bouquet" toilet soap. For five years I have been using it, and during that time I have never suffered with stained or chapped hands, whereas before they used to be cut all to pieces. My patients often say my hands are as soft as an infant's. The soap is rather expensive, to be sure, but what of the expense when we can by using it have clean, soft hands all the year round? I expect to use none other as long as I can purchase it.—WILLIAM A. MILLS, D.D.S.

It ought to be generally known, if it is not, that nitrous oxide gas cylinders are liable to be burst by undue expansion of their contents if exposed to heat. All who use or handle these cylinders should be careful to keep them at as low a temperature as possible, and never allow their exposure to the direct action of the sun. The bursting force of compressed gas under too high a temperature is tremendous,—equal to a bombshell.—I. C.

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ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

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[Entered according to Act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
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(Continued from page 407.)

As the *fourth* grade of periodontitis, I have given such cases as necessitate an almost immediate abandonment of all resolving, anti-phlogistic medication, and an equally prompt resort to that stimulation which shall most quickly and most comfortably result in *suppuration*.

These will be found in connection with patients who are irritably perceptive and incapable of *long* endurance; or, again, such as without undue nervous perception to irritation are yet lacking in the tissue essentials to prompt recuperative effort.

With the first class we find a decided appreciation of pain, and an equally decided determination to endure, *provided* the endurance is not to be too much taxed by prolongation of suffering,—they desire that the teeth shall be saved, but they wish decided measures instituted to the end that the most positive relief shall be afforded in the shortest space of time, but all within reasonable bounds.

With the second class we have a less decided expression as regards suffering,—but nevertheless decided,—and with such the work of inducing suppuration, while none the less demanded, is one of much easier possibility.

It is only through “experience” or through a knowledge of individual peculiarities that the existence of these cases is, at once, diagnosed; but an acquaintance with facts concerning them and with their position in the consecutive grades of periodontitis will cause a comparatively prompt recognition of them, and especially when the first

marked efforts at "resolution" have proved signally inadequate. At once, all the knowledge which has been gained concerning conditions which *are* amenable to resolving treatment is accepted as the basis from which to depart in the pursuance of another mode of relief by an entirely different route.

The peridental membrane in all its present pathological complexity is still recognized as the starting-point for thought, but the necessity for involving much surrounding tissue in an inflammatory condition of so high grade as to be *death-dealing* is equally recognized.

It is at this point that the anatomy—general and minute—and the physiology—general and special—of the parts is to be recalled, for, practically, these are yet in a state of normality, and, to the insuring of the most complete meeting of every indication, as phase after phase develops, it is essential that a clear mental perception should be had of every consecutive change taking place in the passing of the tissues from healthy life to death, and on, from this, to the establishment of such conditions as will permit of final cure. Having, then, an inflammation of a membrane, so situated anatomically as to preclude the possibility of giving that amount of relief—medicinal and mechanical—which is necessary to insure resolution, the first thing to be considered is, what will best secure that increased irritation which will eventuate in *suppuration*?

It has been shown that an opportunity for "drainage" through the apical foramen would permit such flow of effused fluid as, in ordinary cases, would promptly afford relief, mechanically. It has been shown that in cases of greater gravity this same method of "venting" was a most important factor in the obtaining of that comfort which, however, was but gradual in its accomplishment. It has been shown that after the induction of perfect comfort, and after the restoration of the membrane to a condition of *apparent* normality, it is only needed, in a large proportion of cases, that this drainage shall be stopped, when all the previous symptoms of irritation will promptly supervene. It has been shown that unless the vent is again afforded, this irritation will increase until it will assume a type which, in violence, will equal the original periodontitis.

It then is but reasonable to admit the power for increasing irritation, to any extent, which is possessed by stopping the tooth, if it be open, or by permitting it to remain closed if it is presented for treatment in that condition, and the point for study is, *the proper use* of this valuable adjunct in the prosecution of the present purpose.

With the first class of patients, noted above, an inability to so open the canals as to use them at first as means for amelioration will, not infrequently, soon eventuate in placing the teeth in the *fifth* grade of peridental irritation.

With the second class of patients referred to this is very rarely the case, and indeed never, unless some unfortunate concomitant exists, such as depressed systemic condition, extraordinary demands for exertion, or inability to give any time to suffering.

But with the frequent chances for trouble on the one hand, and even with the predominance of comparative immunity from excessive suffering on the other, I yet regard it as *decidedly advisable* that a vent, easy of opening, should be obtained, even if it is accomplished at the cost of some infliction, and even if it is again stopped more or less immediately.

My reason for this is, that it places this potent means for irritation and this desirable means for relief *under the control of the operator*, to be so used by him in the prosecution, or retarding, of the advance towards suppuration as shall best secure to the patient the desired results in the least painful and most satisfactory manner.

With patients of the first class, the opening of a vent is usually attended with a considerable degree of relief, although this is sometimes not sufficient to obtain any other admission on their parts than the fact that the pain does not increase even under the irritation of dental manipulation; this shows that some relief is afforded to the membrane, even though it may not be sufficient to be appreciated by the sufferers.

Again, it sometimes occurs that no relief whatever seems to be given by the venting, but that an aggravation of pain results from the irritation incident to the operation.

When this is the case it should be combated by the applications and methods, both local and systemic, which have been given in the discussion of third-grade periodontitis, but it should always be remembered that these should be used in such wise as to reasonably control, but not seriously interfere with, the progress towards suppuration. Thus, if cool applications are used, they should be so regulated as to alleviate, instead of attempting complete relief; if tincture of aconite is applied to the parts, it is better that it be the *ordinary*, and *not* the dental tincture, the object to be attained being the least possible pain during the gradual, but sufficiently prompt, increase of irritation.

If it be that the pain continues about the same after the vent is made, *and it is endurable*, nothing better in regard to the vent can be done than to leave it open; it is thus acting as a safety-valve, permitting—so to speak—a sufficient head of steam to insure progress, but preventing any degree of pressure which would become intolerable.

Should it be that the “considerable degree of relief” mentioned as the usual result of venting these cases should rather increase in

amount, and yet should not—as it would not—afford other change of sensation than merely modified suffering, the vent should be gently closed by a loosely-rolled pellet of cotton, or more tightly closed by the introduction of a more tightly-rolled pellet,—this governed by circumstances,—beginning with gentle closure; the object being to increase the pain and yet keep it within the bounds of endurance.

In these cases I should advise against the introduction of canal-dressings, however loosely, as the pellets are more under the management of the patients and can thus be more readily removed should circumstances require it when a visit to the office would be impracticable.

Nor is this the only reason for not employing canal-dressings, for the canals are often very useful media for medicinal applications which, as aconite, or chloroform, or laudanum, or hamamelis, may soothe, or, as tincture of capsicum, may stimulate to the final result.

With patients of the second class the making of the vent is almost invariably attended with a degree of relief which is at first quite hopeful, and which sometimes requires one or more hours, and may even require a day (though seldom), before it is assured that venting and medication are, combinedly, unequal to the emergency.

It is in these cases, perhaps more than in any others, that *moderate competency* sustains its own and the patient's hopes through protracted and serious suffering by a partial appreciation of the requirements,—the teeth are stopped until they absolutely demand venting, and are then vented so thoroughly that, although it is not recognized, they have for hours actually demanded stopping, until, as the result of twelve or fourteen days' work, they are extracted just when a *few hours* of decided stopping and stimulating topically, together with an opiate for the insuring of the little necessary endurance, would end in a full flow of pus, bringing with it perfect relief and the intensest satisfaction. And it is, equally, in these cases that a full recognition of the individual demands of each is promptly followed by an *endurable succession of complications* which terminate, with reasonable celerity, in the bestowal of comfort and in the saving of the teeth.

It is to be understood, then, that the aim of all treatment is the maintenance of that condition which shall preclude the possibility of any attempt at "resolution," no matter how feeble; and, more than this, that sufficient irritation shall be secured to provoke constant progress towards inflammation of contiguous parts and supuration of the tissues most diseased. It is also to be regarded as essential that this be done with the least possible infliction to the patient.

In cases of the first class it is usually better, under all circum-

stances, to leave an open vent, for even *with this* it is sometimes necessary to soothe gently for a few hours—it may be, for a day—before commencing stimulation.

Should this be needed, it is usually best accomplished by the mildest pain-obtundents. Small pads of several folds of soft muslin may be frequently saturated with Pond's extract (*hamamelis*), or with paregoric, or laudanum and water, equal parts, or *very dilute* *phénol sodique*. It is not well to use strong applications, such as tincture of aconite, for example, because of the inciting of the parts to undue resistance to stimulants, and such should, therefore, never be employed except in cases where they are temporarily *demanded*, other and milder remedies having proved unavailing.

As soon as pain has been subdued to within the limits of reasonable endurance, the first attempt at stimulation should be made by a "ginger-bag;" this is made of muslin; a convenient size is three-fourths of an inch in length and three-eighths of an inch in width. The little bag is *loosely* filled with ground ginger; it is moistened with water and applied to the gum over the affected tooth.

It soon readily adapts itself to its location, is easily maintained in position, and exerts that gentle stimulation which is acceptable.

If this is insufficient to cause desirably rapid progress, a "pepper-bag" may be substituted for it,—these are made of the same size as that given for the ginger-bags, but they are so much stronger that I have found it advantageous to make them of rubber cloth—*not* rubber dam—and muslin, instead of all muslin. Having cut the pieces of muslin and rubber cloth to a proper size, two sides and one end should be sewed together with a *close* "over-and-over" stitch, but so neatly done that the sewing does not make a hard, cord-like edge; the bag should then be loosely filled with a mixture of equal parts of ground red pepper and ground ginger, and the open end be sewed up.

Before applying the "pepper-bag" it should be soaked a few minutes in water,—five or ten,—when it should be placed upon the gum, over the sore tooth, with the muslin side against the gum and the rubber cloth against the cheek.

This prevents the pepper from too severely irritating the cheek, and secures increased irritation at the place where it is desired.

It sometimes happens that the "burning" of the pepper-bag is too intense, even with the precaution of the soaking. Should this be, it will be rendered more tolerable by removing the bag, washing it off in cool water and rinsing out the mouth, and then replacing the bag. It is sometimes necessary to repeat this washing and rinsing operation two or three times, but this is very unusual.

When the pepper-bag has been made acceptable it should be worn *constantly*, except while eating or sleeping.

After it has been worn for some days, and, indeed, when it has apparently lost *all* its strength, *it must not be regarded as worthless, for it is then in the very best condition to produce excellent results in these highly susceptible patients.*

If these seemingly worthless pepper-bags were dried and then tested with the tongue, they would be recognized as possessing quite enough taste of capsicum to insure sufficient irritation for all practical purposes.

It is, therefore, only very exceptionally needful to use more than one pepper-bag in cases of *fourth-grade* periodontitis of the *first class*.

But while in most cases of this kind it will be better to carry them through with an open vent, some will occasionally require that the irritation of closing the vent be added even to that of the pepper-bag; when this is so it should be loosely stopped at first, until, upon trial, it is found possible to stop more tightly.

There are few things in the whole range of dental therapeutics that require as much judgment as the aiding of *vital* irritants in their work of securing pus-formation, by that *mechanical* irritation which comes of closing vents; and yet with a clear perception of *what* is desired and *how* it is attained, and that attention to symptoms which is naturally begotten of the possession of such knowledge, it is comparatively an easy thing to attain capability for the conduct of such cases with a very moderate amount of experience; and yet, again, among attempts at terminating periodontitis by suppuration, it must be remembered that some are exceedingly difficult of attainment even to the most experienced and most able practitioners.

The recollection of this will not only sustain under defeat, but will do better: it will frequently sustain under trial, in such wise as to encourage to renewed effort, and may thus secure final success under circumstances which would otherwise be overwhelmingly disheartening.

In these difficult cases, then, when careful and well-regulated stopping of vent is found to increase too much the severity of infliction, the cotton pellet should be removed, the infiltration of effusion be allowed to escape, or be gently removed either by fine probing or by the use of *absorbent* cotton or bibulous paper, and, a receptacle for further effusion having been thus provided, the vent should again be stopped as before.

In these cases it should also never be forgotten that *constitutional treatment* is almost always indicated, and such medication should be resorted to as would tend to *prevent* systemic complications.

For this purpose I would recommend the occasional use of assa-fœtida, valerianate of ammonium, bromide of potassium, tincture of opium, solution of sulphate or meconate of morphia, Hoffmann's

anodyne, or spirit of Mindererus in carbonic acid water; any of these will be found quieting and supporting, and used according as they are indicated by the varying gravity of the demands, will notably help to a desirable consummation.

(To be continued.)

GOLD CROWNS.

BY EUGENE S. TALBOT, M.D., D.D.S., CHICAGO.

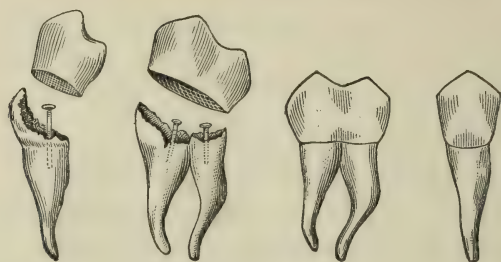
THE adaptation of gold crowns to otherwise worthless roots of natural teeth, in order to preserve their usefulness, is one of the modern expedients which claims the careful consideration of every member of the dental profession. Only within a few years has it been thought desirable to do anything in this direction. The rule has been to sacrifice all such remnants in order to prepare the mouth for an artificial denture. The plan of treating roots by filing them off level with the gums and filling them, in order to preserve the natural form of the arch, where an artificial denture on a base plate is to be worn, has not met with general favor,—the tendency of the roots under such circumstances to a gradual protrusion from the gum causing great trouble to both patient and operator. Moreover, it is not always desirable to insert an artificial denture containing one or two teeth, especially when they are required for only one side of the mouth. In supplying molars or bicuspids in such cases a full-sized plate is required, and in cases of difficult articulation the necessity of clasping the plate to the opposite side of the mouth is productive of a great amount of discomfort.

The credit for the suggestion of gold crowns is due to the late Dr. B. Beers, who settled in California in 1849. He received a patent for his invention in 1873. While in San Francisco in the spring of this year I had the opportunity of examining several crowns inserted by him which had stood the test of more than seven years of service. Owing to the death of Dr. Beers, in 1874, but little has been done towards bringing this valuable invention to the notice of the profession. In explanation of the invention of Dr. Beers, I copy the circular (with cuts) sent out by him to the profession in 1873:

"FIRST.—Do not undertake to fit a gold crown on an old root, unless there is sufficient left of the broken or decayed tooth above the surface of the gum to allow a band of gold to encircle it.

"SECOND.—Take an impression in wax of the broken tooth requiring a crown, and make an articulation. This will give the exact size and form required. It will save both the patient and operator much time.

"THIRD.—Take a strip of flat gold, and strike with the punch in the center of it, into a piece of lead. This will give the front form of an incisor, lateral or bicuspid; then anneal the gold, and bend the



two ends round the tooth requiring a crown; when properly fitted, solder the ends together; then adjust the bite by hollowing out with a half-round file, so that it articulates properly with its antagonist.

"FOURTH.—Then bend a piece of thick flat gold with half-round pliers to suit the form of tooth required, and solder securely on the top of gold tooth and finish up.

"The above directions refer only to incisors, laterals, and bicuspid. For molars:

"FIRST.—Fit a stout gold band around the neck of tooth; see that it fits exactly; then strike up in a piece of lead a gold crown, the size required, and run some gold solder into it to make it strong; file it down; adjust and solder it neatly on the gold band that fits the tooth; this will give the exact form of a molar, and make a perfect cap or crown for root.

"SECOND.—In some cases it is not necessary to use gold screws with T heads, as the gold crown fits so closely and firmly to the root that the cement is found quite sufficient.

"THIRD.—It is found desirable sometimes to lance the gum around the neck of the tooth, to allow the crown to fit well and prevent inflammation.

"The cement found most suitable in fastening on these crowns is the German os-artificiel."

FIG. A.



In selecting roots for the application of gold crowns, care should be exercised to select those only which are firm in the alveolar process, or which can be made firm by treatment. The tissues being in a healthy condition, and the root filled, any remaining portion of the crown and neck of the tooth should be trimmed with a co-rundum wheel or file into right-angular surfaces, as in Fig. A, so that the circumference of the crown shall not be larger than the circumference of the root over which the

band is to fit. An impression should then be taken, in plaster or wax, not only of the root of the tooth to which a crown is to be adapted, but also of the adjoining teeth, and the articulation taken as well, thus securing measurements of length and width, and any deviation in the position of the natural teeth. The gold to be used should be 22-carat or coin gold, rolled to the thickness of No. 27, Stubs's gauge. The distance from the free margin of the gum to the edge of the alveolar process should then be ascertained, and a strip of gold cut in width a little less than the distance from the alveolar process to the grinding surface of the occluding tooth. It is not necessary to incur the expense of making a steel die, as suggested by Dr. Beers, but, after annealing the gold band, bend the end of it with round-nosed pliers, fitting it either to the root or to the plaster model. After accurately fitting the band, saw off the surfaces, and with a file reduce the edges so that when brought together the diameter of the band shall be a trifle less than that of the root. The edges should then be united with 20-carat solder. The fit of the band may then be tested, either upon the natural root or upon the model. A piece of gold plate, filed to the shape of, but a little larger than, the diameter of the band, should now be soldered to the band. The cusps can be made for bicuspid or molars either from gold plate cut into the proper shape, or by fusing gold into globules by the blowpipe, and subsequently flattening them with the hammer,—these placed in position and soldered to the grinding surface. When polished the crown is ready for the mouth. For attaching the crown to the root I prefer Hill's stopping, red gutta-percha, or one of the non-irritant cements, instead of an oxy-chloride of zinc cement, as recommended by Dr. Beers, the latter having caused trouble occasionally by producing irritation of the gums and mucous membrane.

In the case of a root decayed either upon the side or in the center nearly to the alveolar process, and yet firmly fixed in the jaw, or in the case of a crown partially decayed and on which, owing to its peculiar shape and position, it would be impossible to attach a gold crown in the manner described, I have practiced the following method with success: Preparing the root precisely as in the preceding case, I cut the remaining part of the crown down to one-half its length; trim the rough edges; separate the gum down to the alveolar process; adjust the band as before; remove and solder; get the distance from the alveolar process to the external end of the root, and file a piece of gold plate to fit inside of the band. After finding the position and direction of the pulp-canals, I punch holes in the plate to correspond therewith, adjusting the plate inside of the band so that the distance from the plate to the edge of the

band will be a little less than from the end of the root to the alveolar process. (Fig. B.) I then solder the plate in position, and enlarge

FIG. B.



the holes so as to admit the screws to be used. I then place the band over the root and pass drills through the holes in the plate to enlarge the canals, and make them the length required by the screws; then remove the band and place wires of the same size as the screws into the holes in the plate; then place in a sufficient quantity of red gutta-percha (warmed) to fill the space between the root and the plate; insert the ends of the wires into the canals, and force the band into position. When the filling has

hardened, remove the wires and secure screws in their places. A crown attached in this manner will resist the greatest strain required of it.

In completing such operations the practitioner has a choice of three methods, and must be governed by circumstances in deciding which to employ. A filling may be inserted in the ordinary manner; a gold crown may be slipped outside of the band; or, where the adjoining teeth are very near together, a crown can be made to slip inside of the band,—in either case cemented with red gutta-percha or Hill's stopping. If the operation has been skillfully performed, the union will be firm and lasting.

Looking at it from a physiological stand-point, we see the following reasons why such operations are desirable: After the death of the pulp the source from which the dentine and enamel receive their nourishment is cut off, but the cementum, receiving its pabulum from the pericementum, may and frequently does live many years after other portions of the tooth have lost their vitality. If the crown be perfectly fitted and securely attached, it makes a better operation than are the majority of contour restorations. The exposed part of the root, being entirely protected from the fluids of the mouth, is not liable to caries.

The advantage of this method of restoring the crown of a tooth is thoroughly appreciated by those who have undergone the tedious operation of restorative fillings. The only discomfort occasioned to the patient by this method is a slight inflammation, which generally follows the forcing of the band into place.

THE NECESSITY OF DENTAL APPOINTMENTS IN THE ARMY AND NAVY.

BY GEORGE H. PERINE, NEW YORK.

ABOUT the year 1858 attention was called to the subject of the appointment of dentists in the army and navy, and the writer, who was at that time the editor of the *New York Dental Journal*, took an active interest in the matter; but, although the subject was more or less agitated by the dental press throughout the country at intervals thereafter, it was not until August of the year 1861 that the American Dental Convention (at the session held in New Haven, Conn.,) appointed a committee of five, consisting of Drs. W. H. Atkinson, Cleveland, O.; G. H. Perine, New York; B. W. Franklin, New York; J. D. White, Philadelphia, and I. J. Wetherbee, Boston, to inquire into the advisability of the course. They conferred with Surgeon-General William A. Hammond, and the matter was very favorably received by him. But no positive action was taken until 1868, when a bill authorizing the appointment of dentists in the army and navy was drafted and presented before both houses of Congress by Senator Hamlin, of Maine, which was referred to the Committee on Military and Naval Affairs, by whom, however, no decided steps were taken. A second bill was, during the Forty-Second Congress, laid before the House by the Hon. De Witt Townsend, advocating dental appointments at the United States military and naval academies, and, as before, the subject was referred to the committee, who failed to bestow upon it the attention so important a matter deserved. A dentist has, it is true, been appointed at the Annapolis Academy, with the rank of assistant surgeon, but beyond this nothing has been done in the direction referred to. It strikes us as not a little singular that a movement of such importance has of late received so little notice from the members of our specialty. To those who have given the subject consideration, the necessity of appointments of the character we refer to must be apparent. Sound teeth are among the physical requirements of soldiers and sailors, and certainly no physician or specialist will deny that attention to the preservation of these organs does much towards preserving the health of those in our country's service, and that the evident lack of interest displayed by the government is highly reprehensible. For some years past the establishment of dental chairs in the State medical colleges and the treatment of dentistry as a specialty of medicine have been more or less agitated, and strongly advocated by a large number of the leading members of the profession, and it is doubtful whether any stronger argument can be advanced in favor of such a movement than that contained in this article. A union of dentistry with medicine would be

a decided step gained in favor of the appointments herein suggested, in making which no additional expense would be incurred by the government. Doubtless much of the opposition which advocates of the cause have had to contend with has arisen from the fact that few, if any, of our army and navy surgeons possess a knowledge of dentistry, and that the appointment of physicians practicing our specialty would necessitate a new order of things in this particular direction. At the military stations of the far West, and on board naval training-ships, the services of a dentist are often required, and much suffering is at times experienced for the lack of proper treatment of diseases of the oral cavity. This fact in itself should prove a sufficient incentive to a vigorous movement on the part of not only those practicing our specialty, but physicians also. There is no excuse for the indifference displayed by the government in a matter bearing so directly upon the sanitary condition of its servants. There is little doubt that those members of our specialty constituting State dental associations could, by a joint effort, enlist the attention of a sufficient number of our national representatives to insure the successful accomplishment of this very necessary measure.

TRANSLATION.

NEW OBSERVATIONS IN MYCOSIS.

TRANSLATED FOR THE DENTAL COSMOS.

THE writer has been observing a case of chronic pyæmia, and has discovered in the discharge of the various abscesses a new growth. The discharge was a tough green slime, the odor of which was highly offensive, and which was covered with small yellowish particles of the size of a millet-grain and larger, easily removable by the point of a needle. Under a magnifying-glass the particles were observed to consist of a yellowish-brown center surrounded by a small dark zone that appeared to consist on further examination of particles of fatty matter. Among these latter particles were found fibers of a remarkable firmness. On pulverizing the center of these growths, the following three ingredients were brought to light: (1) Long, pale, smooth mycellus fibers, generally curved, though twisted at times into the shape of a corkscrew, and, in some instances, dichotomically divided. The branches were subdivided, and, as above, either curved or in the shape of a corkscrew. These fibers extended into the surrounding zone of matter and formed meshes, in which

the fatty particles rested. (2) Extremely delicate particles, some smaller, of the size of the micrococcus, others larger, their size equivalent to the meso- and megacoccus of Billroth. (3) Pear- or club-shaped bodies of intense luster. At times these bodies seemed divided into different pièces. The pointed end often extended into a fiber. These pear-shaped bodies appear to be really only an enlargement of the fibrous growths, the most of which are detached in the process of pulverization. At times these enlargements are not as thick, yet as lustrous as the bodies. Many of these latter are not as lustrous, and from these the contents and the membrane may be separated. All this tends to prove that the lustrous pear-shaped bodies are coniform, and produced by the fibers. All the ingredients of one of these centers are turned to a brownish-yellow by a solution of iodine, red by fuchsin, and blue by methyl-violet. An analysis of the blood for other growths in this case of pyæmia resulted negatively. In the lower left lobe necroscopy brought to light cavities, in which the elements of the same growths were contained. From one of these depressions the opening through the thorax under the skin had originated. These cavities were the source of pyæmia. The writer concludes the growths in them to have been produced by ulceration of the bronchiæ. Possibly the depressions themselves were ulcerated bronchiectases, caused by shrinkage of the lower lobe in consequence of interstitial pneumonia and pleuritical growths, resulting from a fall on the edge of the bed.

How the seeds of these growths were introduced into the bronchiæ—whether drawn in from the outer atmosphere or through aspiration from the hollow of the mouth and throat, whence so many parasites come—must remain undecided. A few similar cases, however, that have fallen under the writer's observation seem to favor the opinion that the origin of such growths is to be found in carious teeth.

Hermann Eberstein, aged thirty-six, had repeatedly suffered from alveolar abscesses, which were ultimately succeeded by an abscess of the throat. On incision, the latter was emptied of a sero-purulent fluid with a weak alkaline reaction, in which an uncommonly large number of particles—some white, some yellowish-brown—were suspended, from submiliary size to that of a pin's head. These particles were, in composition, similar to tallow, and adhered easily to the wall of the cavity in which the pus was contained. Macroscopically and microscopically they were the same as the particles described in the above case of pyæmia, with the exception that, in one preparation, a group of club-shaped bodies and fine particles were plainly of a greenish-yellow tinge, which had not been observed by the writer in the former case.

Although the writer neglected in this case to examine the carious

teeth, the next following one gave him occasion to establish the fact that these growths vegetate in the roots of the teeth, and in the abscesses that originate in them.

A three-year-old girl, Alexandrine Meyer by name, had a small subperiosteal abscess on the edge of the lower jaw, opposite to the third right carious molar. By incision this was emptied of a granulated, odorless discharge, containing particles from the size of a poppy-seed down to atoms hardly visible to the naked eye, the large particles being less transparent than the smaller ones. The latter consisted of numerous closely-packed, globular pustules, granular, and of great transparency. The larger particles consisted of a number of small cysts. The largest particles of the same abscess consisted microscopically of a stroma, from which fine fibers proceeded, often composed at their root of parallel particles of great delicacy. On their peripheral end they were pear-shaped or globular, and, at the same time, lustrous. The pear-shaped end was divided into from two to ten segments. *In the root-canal of the extracted tooth the writer found the same elements as those contained in the abscess.* The writer can say nothing of the botanical position of the cysts, except that similar formations were once found by Leber in a secretion of the lower lachrymal duct, consisting of leptothrix. The writer considers it possible that the formations above described belong to the development of the leptothrix of dental caries. He has found precisely the same cysts in another case in an abscess that originated in a carious upper tooth. As a rule, however, he has found the same growths in dental abscesses examined by him during the last year that are usually found in carious teeth,—leptothrix buccalis, micrococcus, bacteria, and conglomerates composed of long and round particles. A large part of these fungous accumulations are visible to the naked eye, from the finest atoms to those of the size of a millet-grain or larger, appearing now of a dirty-white, again of a brownish color (the darkest in leptothrix).

At last the writer found, in an abscess of the upper jaw close to accumulations of miliary growths, a conglomerate of the size of a millet-grain, composed of delicate fibers, in the meshes of which a finely-grained micrococcus-stroma lay. These fibers were identical with those described in the above cases of pyæmia and abscess of the throat. The absence of the lustrous pear-shaped bodies is nothing against the identity, for this was so even with a number of particles in both the former cases.

These investigations have led the writer to the conclusion that carious teeth are at times breeding-places for fungous growths, the pernicious propagation of which throughout the entire system was conclusively proved in the above case of pyæmia.

In connection with this the writer would like to communicate an investigation of Dr. Haussmann's. He removed, by means of the Pravaz syringe, a drop of matter from a dental abscess. It was acid in its reaction. The microscope showed it to contain immovable bacterial fibers,—from once to twice the length of a colored blood-corpuscle,—gliacoccus and micrococcus. The author believes that the parasites entered the abscess by a fistula formerly open.

Another opinion is that the usual way for parasites to enter into abscesses of this nature is through the teeth themselves, for the septic contents of the root-canal are certainly the cause of all dental abscesses, provided they can reach the alveolo-dental periosteum through the foramen alveolare of the root after the death of the pulp.—*Deutsche Vierteljahrsschrift für Zahnheilkunde. Résumé of Dr. James Israel's paper in Virchow's Archiv.* H. J. T.

PROCEEDINGS OF DENTAL SOCIETIES.

AMERICAN DENTAL ASSOCIATION—TWENTIETH ANNUAL SESSION.

FIRST DAY.—*Morning Session.*

THE twentieth annual session of the American Dental Association was convened in the hall of the Massachusetts Institute of Technology, Boston, Tuesday, August 3, 1880.

The association was called to order at eleven o'clock A.M. by the president, Dr. L. D. Shepard, of Boston. The proceedings were opened by prayer by Rev. Dr. Studley.

The morning session was devoted to routine business, among which was the adoption of amendments to the constitution, the most important of which was the following:

Under the head of "Instructions to the Publication Committee," after the words "still on hand," insert:

"Any report or other paper, to be entitled to publication in the volume of Transactions for the year in which it shall be presented to the association, must be placed in the hands of the Publication Committee on or before the first day of September, and must also be so prepared that the proof-sheets furnished the authors shall be returned to the committee without material alteration or addition.

"Every paper received by this association, and all plates or other means of illustration, shall be considered the exclusive property of the association and shall be published for its benefit."

FIRST DAY.—*Evening Session.*

Dr. Harlan, from the special committee appointed at the last annual session to confer with representatives of the American Dental Conven-

tion and National Dental Association, relative to uniting the three associations in "one truly national organization," reported that it would not be "wise or materially contribute to that end for this association to disband or in any manner assist in the formation of a new organization;" that, this association possessing all the requisite qualifications of a truly national body, the committee recommends that it take no action which would in any way tend to impair its usefulness or terminate its existence. Adopted unanimously.

The Sections were called for reports, and Dr. Odell, from the Sixth Section, Pathology, Therapeutics, and Materia Medica, announced two papers and a report of cases.

Dr. W. N. Morrison, St. Louis, gave a verbal statement of three cases of enlargement of the antrum. The first was that of a young gentleman, who came to him complaining of a regular, heavy feeling of pain in the right side of the antrum. He examined the teeth and found them in good condition, only one having been filled, this one having a pretty good-sized filling of gold. As no other cause for the symptoms was apparent, he supposed that a dead pulp was at the bottom of the trouble; accordingly, the filling was removed, and he commenced to drill towards the pulp, but the sensitiveness developed induced him to desist. The next day the pain had increased and the swelling was larger. There was no evidence of periostitis, and an application of iodine was made to the gum. The following day the patient, on blowing his nose quite violently, started a copious discharge, and from that time the swelling decreased and the case got well of its own accord. The second case was of a lady, in whose mouth the second right superior molar was dead and the pulp of the third exposed. The pain in this case was not so marked, but the patient complained of a heavy feeling in the morning on arising, and sometimes at night. The natural opening into the nares was started by the patient's stooping to pick up a pin, and the secretion found an outlet through the natural channel. The case was soon cured. A third case of long standing was where a right superior molar was extracted to relieve a similar swollen face, but without result; and after treatment, the patient was sent by his physician, who had not discovered anything wrong with the antrum, to a dentist, by whom the antrum was found engorged with a semi-solid secretion, which had to be pumped out, and which, as it was discharged, coiled like a rope on the spittoon. The cavity was medicated with dilute carbolic acid and the patient was discharged cured.

Dr. Morrison recommends that in such cases the natural opening be enlarged and used in treatment where practicable. His principal object in calling attention to them was because many such cases of swollen cheek-bones are treated superficially by the specialist instead

of trying to get an injection into the seat of the disease; and because he thought it offered a grand field for the dentist to assist the specialist by counsel or the use of instruments specially adapted to the purpose in view.

Dr. C. A. Brackett, Newport, Rhode Island, read a paper, of which the following is an abstract:

Dr. Brackett's paper first called attention to the use of belladonna in controlling the salivary secretions. Dr. A. F. Angell claimed that in 1870, reasoning from the known properties of the drug, and stimulated by the necessities of a very trying case, he had originated the dental use of belladonna, and since that time he had continued to use it in the class of cases in which it could render the greatest service. The claim is that not only is the flow of saliva almost completely controlled, but that nervous sedation is also induced. The dose for these purposes is from five to fifteen drops of the fluid extract for the adult,—oftener the smaller quantity than the larger,—reduced proportionally for a child, or equivalent quantities of other forms of the drug may be used.

The second subject considered was the liability of producing injury to the teeth from the nature of the oral medicaments used. The writer's attention had been attracted by finding in the mouth of a gentleman whose teeth he was treating a broad, ragged excavation in the enamel, on the labial face of the right superior incisor, which the patient was positive had been developed recently during a course of frequent applications of tannin to diseased gums. Testing with litmus paper a specimen of tannic acid from his case, Dr. Brackett came to the conclusion that the tannin was the active agent. He had therefore made a series of tests of some of the following agencies frequently used in the mouth: tannic acid, alum, phosphoric acid, the fluid of Wetherbee's Dental Obtudent, salicylic acid, and the ordinary officinal alcoholic tincture of myrrh, all showing an acid reaction. It was hardly necessary to say that all tooth-powders containing alum as an ingredient must exert a deleterious influence. He questioned whether the efficacy of a combination of tannin and carbolic acid may not be counterbalanced by the acidity of the former. When salicylic acid was first introduced he had used it on cotton as a canal filling with gratifying results, so far as the subsequent comfort of the tooth was concerned; but having occasion to remove two or three canal fillings of this kind, the evident rapid progress of white decay in the canals had caused him to entirely renounce its use for this purpose. The practice of sealing into a cavity any substance giving an acid reaction and possessing sufficient affinity for tooth-substance to produce disintegration should be condemned. Specimens of glycerin, absolute alcohol, tincture of aconite-root, and an aqueous

solution of Wyeth's compressed tablets of chlorate of potash were found free from acid reaction, but combinations may be acid when their component parts are not. Deliquesced chloride of zinc, the liquid of Fletcher's Artificial Dentine, of Smith's oxychloride, of Agate cement, of Poulson's cement, and the paste of Fletcher's Dental Porcelain all showed the acid reaction, the liquid of Fletcher's Artificial Dentine very slightly. These tests show that many medicaments should be used with the intelligence, care, and circumspection requisite when dealing with agencies of that class.

The third subject was the obtunding of sensitive dentine. Many attempts to accomplish this have been made, the simplest method being by the exclusion of the oral fluids from the cavity during excavation. Recently the supplementing of mechanical measures for accomplishing the requisite dryness in the cavity by chemical agents has been attempted; that is, by using as obtunders materials with sufficient affinity for water to take it from the dentine. Glycerin and absolute alcohol possess this affinity, but their use causes pain on account of the rapidity and force of their action, so that it has been found necessary to use them in combination with such corrigents, as tannic acid, chloride of zinc, tincture of aconite-root, etc., as should make them substantially painless while still effectual. Dr. T. D. Shumway, of Plymouth, Mass., discovered their value as obtundents while using them to obtain the perfect dryness necessary to his method of working gold, and has used them for more than seven years. His most satisfactory results were obtained from a combination two parts glycerin to one part tincture of aconite-root. Dr. Shumway claims that Nāboli was developed from statements of his regarding his use of these materials. Dr. C. G. Davis also claims to have discovered and communicated to the president of the Nāboli Company the essential ingredient of Nāboli. Dr. S. J. McDougall recommends for obtunding sensitive dentine:

Absolute alcohol, $\bar{3}$ ss;
Glycerin, $\bar{3}$ ss;
Tannic acid, $\bar{3}$ ss.—M.

Also,

Absolute alcohol, $\bar{3}$ ss;
Glycerin, $\bar{3}$ ss;
Chloride of zinc, $\bar{3}$ s.—M.

Dr. McDougall also recommends in cases where it is possible the use of the hot-air syringe, which after all, he says, remains the best dental obtundent. Dr. McDougall had also supplied his combinations to other dentists, among them Dr. Dennett and Dr. Ham, as early as 1878.

Dr. Brackett thought the apparent conflict of these claims was to

be explained by different men working independently and arriving at similar results. Prof. Wetherbee gave the formula of his combination, as follows:

Concentrated solution phosphoric acid, $\mathfrak{z}\text{i}$;

Chloroform, $\mathfrak{z}\text{ij}$;

High proof alcohol, $\mathfrak{z}\text{vi}$ to $\mathfrak{z}\text{vii}\mathfrak{j}$;

Sulphate of morphia, gr. cxxv.—M.

The ingredients to be added to each other and rubbed up in a mortar in the order named.

A company has been formed, as is well known, claiming to own a valuable patent right for obtunding sensitive dentine. After a thorough investigation, the Massachusetts State Dental Society promptly, emphatically, and without a dissenting voice passed resolutions adverse to the claims of the corporation. Dr. Dudley communicated an analysis of Nāboli, made by Prof. B. F. Davenport, of the Massachusetts College of Pharmacy, as follows: The contents of bottle No. 1 were, essentially, sweet oil; of No. 2, sweet oil with a little tannic acid; of No. 3, glycerin and much more tannic acid; of No. 4, chloroform: all scented with attar of rose. An analysis made somewhat later for Dr. McDougall by Prof. Babcock was as follows: No. 1 contains a preparation of petroleum oil, resembling vaseline, perfumed and incorporated with a very small quantity of tannic acid; No. 2 was in all respects like No. 1, except that it contained a somewhat greater proportion of tannic acid; No. 3 contained glycerin perfumed, and holding in solution tannic acid in greater proportion than No. 1 or No. 2; No. 4 contained wood naphtha or methylic alcohol. The writer deprecated the haste of dentists to bind themselves by taking licenses of a corporation having no better claims for exacting tribute than has this one.

Of the combinations named there has not been sufficiently general use to determine their relative rank, but it is believed that at least some of them may prove of service.

Dr. F. M. Odell, New York, read a paper on the "Physiology, Pathology, and Therapeutics of Hyperæmia, however induced."

Dr. R. R. Andrews, Boston, has been accustomed to use litmus paper in making tests of the oral secretions of his patients. In many cases you will find quite as strong an acid reaction from the fluids of the mouth as those shown by Dr. Brackett. You will find in preparing a cavity in an acid mouth that the cavity is always acid. In such cases we should use bicarbonate of soda to get rid of the acid; we should not fill in any case when there is free acid present. The matters presented by Dr. Brackett were worthy of deeper investigation.

Dr. E. A. Bogue, New York, did not know if we might properly speak of Nāboli, but there was one point to which he wished to draw

attention, and that was the clause in the license for using it, which ostensibly allows the dentist who has taken it for one year to withdraw at the end of the year, if he so desires. It should be known that the patent for the bottle has been issued, while that for the material itself has been allowed, but it has not yet been issued. It may not be issued for six months, and until the patent is issued its components are secret. By another clause in the license the taker binds himself, in case of withdrawal, not to use Nābolī, or any imitation of it, or any of its essential component parts. He thought it would be well for dentists to know the composition of the substance before they bound themselves not to use it or any of its component parts.

Dr. H. C. Meriam, Salem, Mass. It does not follow that medicines act injuriously to the teeth in the mouth because they do out of it. Those who in old times did metal plate work, will remember that when they wished to clean a metal plate that had been worn, they had to boil it in soda and remove the coating of mucus before acid would act on it. This same coating is like a varnish over the natural teeth in some mouths, and acid medicines do not always come in direct contact with tooth-structure. The presence of this coating may be detected by painting the teeth with iodine, when it will be readily stained if present. Clean one of the teeth with pumice, and we will notice that it does not again stain when touched with the iodine. The point I wish to call attention to is the protection given to the teeth by this coating when we use acid medicines.

Adjourned.

At the session on Friday, the following officers were elected for the ensuing year:

President.—C. N. Peirce, Philadelphia.

First Vice-President.—W. C. Barrett, Buffalo.

Second Vice-President.—G. J. Friedrichs, New Orleans.

Recording Secretary.—Geo. H. Cushing, Chicago.

Corresponding Secretary.—A. M. Dudley, Salem, Mass.

Treasurer.—W. H. Goddard, Louisville, Ky.

Executive Committee.—S. G. Perry, New York; W. H. Morgan, Nashville, Tenn.; T. T. Moore, Columbia, S. C.

After the installation of the newly elected president, the following appointments were announced:

Local Committee of Arrangements.—S. G. Perry, A. L. Northrop, and Geo. A. Mills.

Publication Committee.—M. S. Dean, of Chicago, and E. T. Darby, of Philadelphia. The recording secretary is *ex-officio* chairman of this committee.

(To be continued.)

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR meeting held at the residence of Dr. O. E. Hill, Tuesday evening, June 15, 1880.

President Dr. W. A. Bronson in the chair.

INCIDENTS OF OFFICE PRACTICE.

Dr. J. M. Howe. I would like to suggest a test for cadmium in our amalgam alloys. I tested several samples some time ago. The agent of a manufacturer of alloys presented me with a sample, which he said contained no cadmium. I tested it in the manner I will describe and found cadmium in it. When I saw him again, I told him that I had precipitated from a solution of a salt of this metal the sulphide of cadmium. He told me then I must have misunderstood him,—that he didn't say it contained no cadmium; there was a little in it, and he meant to tell every one that it contained just two per cent. of cadmium. Then I tested again, and by careful weighing discovered that *it contained over five per cent.* After that, Dr. Clowes, who had written a letter to a manufacturer of amalgam protesting against cadmium as a component of any alloy for filling teeth (and, as you know, at a recent meeting of this society gave as his belief that it was ruinous to the teeth in the least quantity), received from this manufacturer in response to this letter a sample of amalgam which he hoped he would try. I am not sure whether he told Dr. Clowes in the letter that it contained no cadmium, but he conveyed that impression.

Dr. Clowes gave me a sample of that alloy, and I found one and a half per cent. of cadmium in it. In view of the fact that two manufacturers of amalgam alloys have represented their wares in this way, it seems interesting and important for us to know that there are those who are undertaking to humbug the profession.

In testing these alloys the method I have pursued is this: to any quantity of the filings add pure nitric acid. The reaction will be very sudden and violent, reducing the silver to a nitrate, of course, and also the cadmium or copper, if either of these metals is present. By adding water, agitating and allowing to settle, and carefully pouring off the solution thus formed from the insoluble residue, we have a clear solution of the salts of those metals whose nitrates are thus soluble. The silver we may first precipitate with sodium chloride in the form of a white, flocculent mass,—chloride of silver,—its identity being established by its becoming brown on exposure to light. The question now is, does there remain in the solution, which has been carefully poured off the precipitate, any cadmium? By the action of dilute sulphuric acid on sulphide of iron sulphureted

hydrogen is evolved, and if this gas is now passed through the solution, cadmium, if there, will be precipitated as a yellow sulphide. It is laid down in most chemical dictionaries that under the blowpipe alloys of cadmium upon a clean piece of charcoal will give a yellow stain. That does answer where the amount of cadmium in the alloy is considerable,—say ten per cent., or more,—but if below that, I think it would be difficult to determine in this way.

Dr. A. H. Brockway. I presume you are referring to Dibble's amalgam.

Dr. Howe. I refer to Dibble's and the "Boston" amalgam.

Dr. O. E. Hill. Do you consider cadmium injurious in an amalgam?

Dr. Howe. I don't pretend to know. I would not be willing to use it; but I think it should be left for us to decide whether we want to use cadmium in amalgam or not. The point I wish to bring out especially is the fact that we have alloys offered us containing something which some may not wish to use, and attempts are made to deceive with regard to the presence of this compound.

Dr. Benj. Lord. Have we any means for deciding if one and a half to three per cent. of cadmium is injurious?

Dr. Howe. I don't know that we have. I have a suspicion that it is, but I cannot say I have any knowledge. Certainly we ought always to know what we are using. We should not use materials, as the public take patent medicines, with no knowledge of their contents.

Dr. Frank-Abbott. I presume many of the gentlemen present remember the material introduced to the profession some years since under the name of "Wood's metal." It was composed in part of cadmium. I do not know in what proportion, but it contained enough to produce most disastrous results in teeth where it was used. This I learned to my great discomfort, to say the least. Since that time I have been very careful to use no material for filling teeth which contained a trace of cadmium if I knew it. In my judgment these peddlers of amalgams ought to be discouraged. Without the least hesitation they state to me that certain personal friends in whom I have confidence are using their amalgam, and recommend it very highly. The next man they call upon is told that I am using their amalgam and recommend it, when neither of us has ever used it at all. In short, a regular system of lying is kept up in order to dispose of their wares, and I think it is the duty of the profession to discourage all such men and their business.

Dr. Brockway. I had a little experience with Wood's metal, and I found in those cases where I used it that it really seemed to promote decay, and every cavity filled with it was worse than if left unfilled. I had a like experience some years ago with an amalgam

that was recommended to me as very excellent. Its chief recommendation was good color and rapidity in hardening. I used some of that very greatly to my discredit. I am quite sure that it contained a large per cent. of cadmium, from the yellow sulphide which I found in a cavity which had been filled with it. Whether a small amount of cadmium in an amalgam would be injurious, of course I can't pretend to say; but, using the logic of Dr. Abbott, I should suppose that if a considerable quantity would be injurious, a small quantity would be injurious in a like proportion. But be that as it may, we have no necessity for using any doubtful amalgam. We have several amalgams of proved good quality, and there is no necessity of our being victimized by these amalgam peddlers.

Dr. Abbott. Some months since Prof. Buckingham, of Philadelphia, read a paper before this society entitled "The Formation and Development of Dentine," in which he favored the views of Tomes, Sr., and showed drawings taken from the illustrations of his work. The questions which I consider as not sufficiently settled to pronounce positively upon, in reference to the formation of dentine, are these: does the living matter contained in and around the odontoblasts arrange itself in the center of the odontoblasts, and run from one to another like the connections between links of sausage, or does it arrange itself between the odontoblasts to form the future dentinal fiber? or do the odontoblasts and medullary elements of the dentinal follicle become arranged into multinucleated bodies (as in the formation of bone) before any deposition of lime-salts takes place? Prof. Buckingham in his paper favored the former view. Dr. Bödecker, from his researches, has about concluded that this view is not the correct one, but thinks the living matter which surrounds the odontoblasts forms the dentinal fiber. Others, again, are of the opinion that neither view is correct, but that just previous to the beginning of the deposition of lime-salts the odontoblasts are transformed into multinucleated bodies, in which condition they receive the lime-salts, and that the dentinal fiber is formed by the direct connection of the living matter from a point of junction in one of these bodies to a similar point in another.

I am strongly impressed with this latter view, inasmuch, as before stated, it is known that bones all form in that way; and what are teeth but bones, only differing from other bones in degree of density occasioned by the excess of lime-salts?

Our researches have not as yet gone far enough, however, to settle this question. We hope that within a year we may come to a definite conclusion.

The following paper on "Predisposing Caries," by W. Geo. Beers, L.D.S., Montreal, Canada, was then read by the secretary:

A few years ago, in a dental society in the West, a *confrère* presented the sensational hypothesis, founded upon the laws of descent and adaptation, that the offspring of those who have lost their teeth early might be born edentulous. Of course this is bare speculation; but the less startling, though almost as important *fact* meets our observation that there is a degeneracy of the teeth in our generation, and that perfect calcification of tooth-structure is more the exception than the rule. The next worst calamity to being born without tooth-germs, is to come into the world with a constitutional or histological predisposition to dental decay.

One can easily stretch imagination to the verge of believing that had the American fœtus the prescience and the power, it would perpetrate upon itself such a germinal abortion as would destroy its dental follicles forever. I think it has been proven that this New World fœtus is a precocious young animal, and is in as great a hurry, *in utero*, to get into the world as it is, *ex utero*, to get out of it. Young America is called a fast youth; and it must be said that his precocity begins early. But happily for our occupation this is beyond the power even of the fœtus of this fast-going continent; and the questions will continue to force themselves upon our attention, "Why do the teeth decay so early? What can be done to improve their quality?"

I would not presume to answer my own questions fully, or even the one particular point to which I propose to refer. On a future occasion I hope to supplement it. At present I must ask charitable criticism for imperfections and incompleteness.

When we consider that a fair proportion of deciduous and permanent teeth decay a few months after eruption; that a large proportion of the former decay rapidly before any of the permanent teeth appear; that yearly our children patients are upon the increase; and that at a time when life ought to be, and is, in its most perfect bud and bloom, a silent foe prepares disaster for the forming teeth,—it is reasonable to assert that the causes of decay in adult life are not as important for scientific investigation as the causes in childhood. Would we not willingly exchange the knowledge we possess of the proximate causes for more insight into the nutritive mystery of those predisposing causes which have a germinal origin from the fourth to the twenty-eighth week of embryonic and fœtal life? No doubt the proximate causes are largely in excess, but what proportion of these has a histological or constitutional origin? and how do we account for the density as well as the durability of Scotch teeth as compared with American? Teeth are erupted in a condition to resist or invite the chemical causes of caries. Defective structure is congenital as well as acquired; and these congenitally defective points, whether hereditary or traceable to severe illness of the mother during pregnancy,

or of the child soon after birth, are so many predisposed points for the solvent action of acids, the cryptogam leptothrix, or whatever external cause may be present in the mouth. Now, it needs no hypothesis of descent to believe that the continuance of this condition for another century may possibly involve at least the certain destruction of the sixth-year molars on account of miserable calcification, and the more serious destruction of the deciduous teeth before they have accomplished the object of their growth. The conclusion is forced upon us that we overlook too much the embryonic causes, which are more frequent now than half a century ago.

It would seem as if the further we are removed from the old ancestral stock the more predisposed are teeth to decay. Young England has better teeth than young Canada, and young Canada than young America. In America, too, the predisposing causes of decay are largely in excess of those in Europe, owing, perhaps, to the poorer female physique, and the dietary habits of the people. A volume might be written—and ought to be written—on the supposed and proved reasons for the degeneracy of the female physique in America, and especially the degeneracy in the teeth of children. It is easy to attribute this to "the high state of civilization," but what does that mean? Civilization involves many departures in diet and habits from those of our rude forefathers; but it need not involve the terrible drains upon the nervous force; it need not involve the abominable taste for hot rolls, the irregularity and haste of meals, the fear of sunshine and fresh air. No doubt a Scotch Highland diet and a Lowland mist in half a century would either improve or extinguish the American people. They would either thrive on porridge and "bannocks," or die of disgust. No doubt were the people of the British Isles and the Americans to change places, less than half a century would suffice to alter the dietary and other daily habits and customs of the two nations. There is something in our atmosphere which excites fast living, eating, thinking, working; and no one can doubt that all this rapidity of life has its embryonic as well as its adult influence on the processes of development and nutrition. If this rapidity of life has its deteriorating influence upon healthy tissue when development is completed, is it not reasonable to suppose that it would exert a disturbing influence when development is in progress? A healthy process of nutrition is essential to perfect growth. The blood is the commissariat of the growing body, and supplies the tissues with materials for their development. The perverted nutrition of its solid tissues by disease, or by any other cause which alters its normal condition, must affect development and growth.

We find children with everything in their favor,—good health and perfect growth; full of the spirit of play, and having plenty of it;

good food, cleanliness, and sunshine. These children of our wealthiest classes, with these advantages, defeat in a measure the proximate causes of decay. Yet, is it not a fact that they are becoming regular patients? A delicate mother may have offspring with delicate teeth. The hereditary transmission of disease is as certain as that of defect, and it is as reasonable to expect transmitted caries as a transmitted irregularity. But we see thousands of badly-calci-fied teeth among children born of robust parents. No one pretends to say that it is only the teeth of delicate children, or of the children of delicate parents, which decay.

The question must really take us back to fœtal life. If we can do anything to insure the perfect union of enamel-fibers, or, in other words, to grow perfect enamel, we would do everything that is necessary for the eruption of good teeth. The enamel of the grinding surfaces of the molars is now seldom perfect. These fœtal depressions become defects at birth, and defects become decay. Microscopical fissures, defects in the continuity of the enamel extending to the dentine, may have given rise to Fouchard's theory of *caries interna*. Hippocrates may have meant more than he said, or he may have unconsciously predicted, when he referred caries to a bad condition of the "humours."

Our study of caries has been too much confined to the period after eruption. These defects in the continuity of the enamel are in most cases, I believe, of embryonic origin, and cannot be "pathological," as stated by Tomes. In a number of dissections made by me of the jaws of the fœtus, and of infants previous to the eruption of the teeth, and at a time, of course, when the enamel should have been completed, I found structural defects, such as the microscopical fissures seen after eruption. These were present, especially in the forthcoming molars of the deciduous teeth, and in the grinding surfaces. Development of enamel was here *imperfectly completed*; and immediately upon eruption, the proximate causes of decay would have defective points to act upon. There is nothing pathological here, except it be proved that pathological causes occurred in embryo. It is not a chemical cause, because that involves circumstances not possible in embryo. Not a vital process, because that involves external irritation and organic changes after full development of the teeth. Not parasitical for the same reasons as not chemical.

May not caries, then, have physiological causes, and a large proportion of teeth be thus predisposed to decay, as a fœtus may grow to birth predisposed to disease?

We see defects in enamel of permanent teeth; pits, excavations, transverse notches, and complete atrophy, the result of severe disease during development of enamel. Jacobi says, "Acute exanthema are

said to produce the dispersed excavations; acute inflammatory diseases the furrows; and rachitis the entire absence of the enamel." But in the absence of any of these diseases we find the congenital defects in the enamel, which must have an embryological origin. So much so that we may say there are germinal causes of decay.

What are the influences which change the normal condition of the enamel, both of the deciduous teeth in embryo and of the permanent teeth before eruption? Drs. Legros and Magitot, in their brochure on the origin and formation of the dental follicle, ably translated by Dr. M. S. Dean, have given us a chronology of the follicle, showing the periods in which its several component parts appear. They conclude that at the seventh week there is no ossification either upon the cranium or the face, but that "the lower jaw alone presents some rudimentary osseous arches." The follicle, however, has not appeared. At two months, "the formation of the dental groove commences at this period of development, and the epithelial cords representing the enamel organs are very clearly defined; the dental bulb has already made its appearance." These writers fix the time of the appearance of the epithelial lamina between the seventh and eighth weeks of foetal life; and the genesis of the enamel organ from the epithelial cord, about the eighth week. At the fourth month it was discovered that "while the incisors and canines are provided with a cap of embryonal dentine, it does not appear upon the molars until about a week later." At this period the enamel organ is completely constituted with its internal layer of cells (ameloblasts), and the *stratum intermedium* well defined. It was also observed that at this time "the buddings which are destined to form the secondary cords, or the enamel organs of the permanent teeth, emanate from the primitive cord."

I do not propose to follow out at length the phases of dental evolution so beautifully described by Drs. Legros and Magitot, but merely to urge a more thorough study of the physiology of the dental follicle. So far our information has come from Europe.

The practical importance will be that it may help us to fix the fact in the minds of parents and physicians that the time to begin thought and care for the teeth is not after they are erupted, but in the early months of foetal life. And in directing thought to this, thought is directed to the whole foetus. The care directed to grow good enamel is sure to contribute to the development of a healthy child. If the germinal teeth are poorly nourished by poor blood, so will the whole foetus suffer. If the teeth in the vascular and soft condition of their primary stages are perverted in nutrition, so must the whole foetus be. The elements in diet necessary to grow good enamel will likewise contribute to grow good bone.

The importance of proper diet for the mother, both when the child is in embryo, when it is at the breast, and when it leaves the breast for food likely, in our modern customs, to contain less nitrogenous and fatty nutriment,—the importance of this is clear. There is a deficiency generally of lime in the blood of the pregnant woman; a deficiency of lime in her milk and in the other food before and after weaning. The mother's system is drained of lime to nourish the child in embryo and at the breast, and her teeth suffer. The question of food in relation to the teeth is not one I propose to discuss. We know enough, perhaps, about it, if we could only impart it to parents at the proper time. To make mothers feel that they alone can make or mar the perfect health of their offspring; to enforce upon them the responsibility they have in so feeding themselves during pregnancy that they will bring healthy children into the world, will be the great advance towards securing well-calcified and well-developed teeth. There is no sound reason why otherwise healthy children should have miserably calcified teeth. To get Scotch teeth it ought not to be necessary to get Scotch mothers, but it is necessary to get Scotch diet and habits. There is no end to the interest and profit of this subject, and I regret that I have only had time hastily to run this paper together.

Discussion.

Dr. Lord. I do not feel competent to discuss the merits of the paper that has just been read, but I can see that there is much in it that is highly reasonable and sensible, and that shows that thought and investigation are progressing in the dental profession. Special conditions are assumed all along through the paper, and they are recognized as more or less of a practical character, and no doubt could be acted upon in promoting a healthy, general development, and hence promote the growth of good teeth.

I do not suppose that the teeth of the present generation are deteriorating in quality, or will do so only as the general constitution deteriorates. It is quite true that we do not always find good teeth where there is apparently good general health, nor do we find poor teeth where there is apparently poor general health. I think there can be no question that poorly organized and poorly developed tooth-structure is greatly owing to a weakness of the constitution, which shows itself in the teeth, but which, like all weaknesses, may be more or less strengthened by the use of proper means at the right time.

The question of the proper kinds of food and nourishment on the part of the mother during the foetal life of the offspring is given great importance in the paper, and with great propriety.

Due attention to it would unquestionably have most beneficial

results upon the general development, and, as would naturally follow, in the formation and growth of good tooth-substance.

Science will teach us what kinds of food are best suited to every period of life, but the matter receives very little attention practically. Physicians can have more to do with the question, directly, than we can, as dentists, though it is eminently proper that we should thoroughly understand it; but they have not talked about it or taught it sufficiently to have made much impression upon the community at large.

The teeth of the Scotch are referred to as perhaps being better than most other nationalities. I do not understand that the Scotch people who live in the cities of Scotland, and whose lives and habits conform to city life, have any better teeth than the people of most other countries who live in cities, and whose habits are much the same. But in the Highlands of Scotland, where the people live very simply and lead an out-of-door life, they have not only good teeth, but good general health. So, I suppose, we must have a Scotch mother from the Highlands of Scotland, or a mother who has a good constitution inherited through generations, to grow the best quality of teeth. If the time shall come when greater attention will be given to the quality of the food, to temperance in eating and drinking, and to the matter of healthy intermarriages, it will be well for the race in regard to good teeth and to general good health.

Dr. Brockway. I do not propose to discuss the paper just read, but it has reminded me of a little incident in the direction of its thought which occurred to-day. A little boy, of about six years old, was brought to me for examination. I knew that he had been carefully brought up, as his parents were wealthy and intelligent, but neither of them having very robust health, I was prepared to find in their offspring teeth more or less defective, as we too often see. To my agreeable surprise I found that child possessed of the most perfect and beautiful teeth I have ever seen. There was not a blemish in them. The four sixth-year molars were in position; the enamel on these as well as on the temporary molars was beautifully fused,—there were no fissures or indentations where inimical substances could find lodgment or decay be likely to begin. I congratulated the mother on the unusual excellence of the child's teeth, and she replied, "This child was not allowed to eat anything except bread and milk until he was four years old; that was his sole diet."

Whether his pre-natal conditions were as favorable as those since his birth I cannot of course pretend to say, nor is it possible to determine how much credit is to be given to his peculiar diet, but certainly his teeth are quite exceptional in their perfection and a "joy to all beholders."

Dr. Hill. The Quakers are noted for their frugal habits and their preference for simple food. Recently I attended the funeral of one of these good people in New Jersey. There were present, dressed in the Quaker garb, perhaps one hundred and fifty persons, between forty-five and seventy years of age. Nearly one-half of this number were toothless. I doubt if the same edentulous condition would be found among the same number of the "world's people" taken from New York or Brooklyn. I know it is not safe to draw conclusions from isolated cases; I simply state the fact of the observation of so great a proportion of edentulous persons among these plain people.

Dr. Abbott. This is a subject of much importance to the human race, not to the American alone, for I believe to-day that the American people as a class have as good teeth as any civilized people on the face of the earth, perhaps with the exception of the English. I think they have better teeth than Germans, Austrians, Russians, or the French, and one reason is that they pay more attention to their teeth. They know more about them and take better care of them. They understand and appreciate the importance of teeth better than they do in any of those countries. Among the poorer classes, as I see them, from Germany, France, and even from England, I have never yet been able to see difference enough in the quality of their teeth to speak of.

This matter of children's teeth in embryo is one of great importance, and no doubt if the efforts of the dental profession in this country could be appreciated as they should be, much good could be done. Ladies will not often ask advice in the interest of an unborn child. I had a case in which I gave a lady syrup of lacto-phosphate of lime for nearly three months before the birth of her child; she took it a week, then stopped a week, then took it a week, then stopped, and so each alternate week. The child is now four or five years of age, and, unlike her other six children, has no decay of the teeth. There never can be much done, however, until the people generally appreciate the fact that dentists know what should be done, that the best results may be produced. A great many children are said to be fed upon oatmeal, hominy, and wheaten grits, with milk, and nothing else. To many children this kind of food is disgusting, and they will not eat it. The only way then is to give them what they crave in the way of food, and if they lack lime, give it to them in the form of syrup of lacto-phosphate.

Dr. E. A. Bogue. Doubtless we have all had some experiences more or less similar to Dr. Abbott's. I will mention one. A lady patient who was under my care before her marriage, and who has remained there ever since, has had four children. Previous to the birth of the first I was made aware of her condition, and of the fact that the

fluids of the mouth were changed somewhat from their normal state. I prescribed, with the concurrence of her physician, "Winchester's hypophosphites of lime and soda." One year later I saw the mother professionally, finding very little to do for her.

The second child came without any precaution being taken. The mother's teeth were very much broken down when I next saw them.

On the third occasion I was again consulted, and again recommended the same course of treatment, and afterwards found very little to do for the mother's teeth.

The fourth time precautions were again forgotten, and the mother's teeth were in such a state that I have never since been able to get them into a satisfactory condition.

The first child, now about fourteen years of age, has good teeth, but irregular. His temporary teeth required almost no attention.

The second child has frail teeth, and the temporary teeth were also frail, and the whole frame (skeleton) rather diminutive; not remarkably so, however.

The third child resembled the first, and gives promise of fine teeth and good size.

The fourth child was lost in birth. All this, however, is but cumulative evidence; it is not proof.

I should differ somewhat from Dr. Abbott in his statement that the American nation, as a whole, is better off than any other nation as regards its tooth-structure or tooth-arrangement, though it may be true that it is as well off, as a whole, in regard to the conditions that would antagonize dental decay. My own actual knowledge is so limited upon this subject that I scarcely dare offer more than an opinion. It will be remembered that Magitot has mapped the whole of France into different districts, showing where dental decay is most prevalent, least prevalent, and moderately so. I am not aware that any such careful work has been done on this side the water. Dr. Abbott is, of course, familiar with this map. It is, likewise, well understood that among the higher class of Germans the teeth are so frail that almost nothing effectual can be done with them. Dr. Abbott's namesake in Berlin has described such teeth as that. On the other hand, the drivers of the carriages which you take for a day's journey make no other provision for themselves or their horses than a loaf of coarse brown bread, which they share during the journey, horses and driver eating from the same loaf. This class of German society will generally be found to have admirable teeth, and they seem to be fairly clean. Indeed, I don't see how they can eat that kind of bread without having clean teeth. The teeth and gums get the necessary exercise. This is why I don't like to mass our own nation or others, for the modes of life are so vastly different at the

extremes of society that the different conditions should be taken into consideration when we begin to draw inferences upon which to base conclusions for our daily action. I never fully realized how little I *knew* on the subject of dentistry as I did when Dr. Metcalf asked me the question, "Is it not possible that mercurial effects may come from amalgam fillings?" I thought it easy to answer no, but I found it took me a whole year, and much labor and expense, to be able to say no, and to know what I said. The paper just read will certainly be very helpful if it stirs us up to keep careful records of what we do. Dr. Hill speaks of the Friends who have lost their teeth, but he does not say whether it is from tartar or decay. Those two diseases seem to me to be in a degree antagonistic to one another; and before we can come to a positive conclusion as to the loss of the Friends' teeth, we must know how they lose them. And, speaking of English teeth, I don't want to say positively, but I don't believe there is a mouth in England, unless it belongs to an American, that is cleansed as we understand cleansing, that is, under the gums, between the teeth and all around them thoroughly after each meal.

Dr. Wm. Jarvie, Jr. Had the mouth been perfectly clean would there have been any necessity of going to a dentist?

Dr. Bogue. I think I can reply, Yankee fashion, by asking another question, Whether Dr. Jarvie's patients don't usually have clean mouths? If the teeth are organized in such a way that there are deep sulci between the cusps, no human appliance short of a plug can prevent decay. The more careful and particular the patients are, therefore, the more probability that they go to a dentist, and take their children early, as a preventive measure.

Dr. Abbott. I don't want to be understood as making any positive statements in regard to this. I am stating my own opinion from my own observation, and from the observation of patients coming almost directly from England, Germany, and France.

Dr. Howe. The paper by Dr. Beers is an interesting one, and this is a very important subject. The conclusions to which apparently Dr. Beers arrives and in which Dr. Abbott to some extent appears to agree, are that to produce well-developed, well-calcified teeth it is necessary to supply the mother with the material out of which teeth are to be made. Dr. Beers says in illustration that it ought not to be necessary in order to produce Scotch teeth to have Scotch mothers. I must dissent from the conclusion that a sufficient amount of material will correct the evil. It seems to me it is a question of assimilation. This theory that we have heard discussed over and over again about the quality of food, the brown bread theory; whether it is food to the individual, or whether it is food to their mother or grandmother, it seems to me does not cover all the ground. The influences that come

down by heredity, especially those affecting the nervous system, it seems to me have fully as much to do with this subject as the food that we eat. A specialist, an authority on skin diseases in the city of New York, has said within a year or two that all skin diseases are neuroses. That is a very startling assertion to make, but it is accepted by many of the most intelligent physicians. The controlling influence of the nervous system in relation to development, assimilation, nutrition, in health and disease, is being more and more recognized. The influences that are producing what we call nervous organizations are having very much to do with the imperfect calcification of the teeth, as well as the abnormal development of the maxillary arches and the regularity or irregularity of the teeth. Too little recognition is given to these influences when this and kindred topics are discussed; we are too much inclined, I think, to magnify the importance of a supply of material. I believe that lack of lime-salts in food is almost never the cause of imperfect calcification of either bones or teeth. To produce Scotch teeth I think we must have Scotch mothers.

Dr. George A. Mills. The subject under discussion is certainly one of much interest both to us and to our patients. What Dr. Howe has hinted about assimilation has far more to do in settling the matter than perhaps it is thought to have. Assimilation is under the direct control of the nervous system; by the various influences about us we are both exalted and depressed; the nutritive department is disturbed or exalted, and therefore hindered in carrying on its legitimate work. I am more and more impressed of late as I read and think upon this subject, that the time is not far off when it will be fully seen that nervous degeneracy is the primary cause of dental caries. You will, if you keep watch of the writings that are being published by those who are making the nervous system a study, find that the current is setting in the direction of which I have spoken. The subject almost always arises regarding the improvement of the physical condition of the child before birth. We will be obliged to go farther back than this. The embryonal conditions of generation will have to have our intelligent attention ere long. We as dentists will be called to meet this question sooner or later. If we will consider for the moment the great variety of conditions, favorable and unfavorable (seemingly more of the latter), under which human organizations are generated, we cannot wonder that so much is "out of tune." This is particularly so among us as a people, living under a strain of nervous tension that is probably not known anywhere else to so great an extent. Now, if this be true, and in my opinion it is so, it indicates the coming demand to be laid upon the dental profession, and I agree with Prof. Abbott that we must prepare our-

selves to meet it; and the sooner we do understand the matter the greater will be our ability to give our patients the service they so much need; and this necessity indicates also the value of advanced scientific teachings, particularly in embryology and histology.

Adjourned.

NEW JERSEY STATE DENTAL SOCIETY.

THE New Jersey State Dental Society held its tenth annual session at Long Branch, July 20, 21, and 22, 1880.

The following is an abstract of a paper read by Dr. J. A. Osmun, of Newark, on "Mechanical Dentistry—Its Progress and its Claims":

We find that by common consent our profession is divided into two branches, that of operative dentistry, consisting of the treatment of pathological conditions of the mouth, while mechanical dentistry is supposed to consist merely of the replacement of the lost organs of mastication. Of the two branches it seems that operative dentistry engages by far the more attention; on the principle, probably, of that very worthy maxim that an ounce of prevention is worth a pound of cure. Yet often in our earnest endeavors to promote one truth we lose sight of others of equal importance.

Viewing retrospectively the achievements in mechanical dentistry from the time of the fathers of the profession down to the present, it is very gratifying to note how much has been accomplished, what great progress has been made toward perfecting artificial dentures, and we have a feeling of pride and gratitude that we are able to replace the natural organs, when they have been lost, so satisfactorily and perfectly, comparatively speaking, as we now do. How crude were the early methods of restoring lost teeth, and how repulsive in some respects, as in the use of other human teeth and the teeth of animals! Compared with these rude efforts, the beautiful mineral teeth that we now have in such variety of shapes are triumphs of art. Note also the long list of materials that have been tried in order to obtain the ideal plate, from those cut and carved from wood and ivory through the entire history of swaged plates to the vegetable compounds of these later days; gold, which, for a time, held place at the head of the list of materials as the base which would meet all the requirements; silver, which had only cheapness for its recommendation; aluminum, and the cheoplastic bases, which soon disappeared; continuous gum, which, for beauty, cleanliness, and symmetry, has no equal, but has objections which preclude its universal adoption.

The vegetable compounds introduced within the last few years have brought about some radical changes in prosthetic dentistry, and

it is a question with some whether or not it would not have been better had these vegetable compounds never been introduced as bases for artificial teeth, on account of the injury caused by their use and abuse by incompetent dentists.

Within the last few months an alloy base has been presented to the profession, which seems to have more merits combined than any of the others in use. Time will prove the value of its claims.

But notwithstanding these triumphs in mechanical dentistry, at no previous time has there been so much injury inflicted, and suffering caused, as at the present, by improperly constructed dentures, and those made of inferior materials.

That mechanical dentistry, intelligently practiced, is productive of as much comfort and contributes as much to the prolongation of life as operative dentistry does, will admit of no argument. But, for some time past, it seems to have fallen into disrepute with some of our brethren, and in fact it is held that the two branches should be separated; that the dental surgeon should confine his attention entirely to pathological conditions of the oral cavity, while the branch of mere mechanics should be delegated to the artisan. This division into separate specialties is open to objection. It is necessary that the operator should be able to restore the mouth to its original shape and expression, and he must have daily observation of dentures as they are presented from time to time in the operating-chair. Without this general knowledge and experience one is not a dentist in the true signification of the word, but a "practical dentist," to quote Dr. Marvin. It requires all the skill of the most consummate artist to properly fashion an artificial denture so as to make it subserve the requirements of mastication and speech, and at the same time restore the natural expression of the mouth. All parts of the face have their fixed relations to each other and to the character of the person, but the mouth, more than any other feature, reveals the nature of the individual. The tongue may be silent, but the mouth never ceases to impress one either favorably or unfavorably; therefore, how important it is that we, who have the making of signs of character in this feature, should give the subject the closest attention. One, too, often sees the evidences of neglect and ignorance of the relations of the mouth to the temperament of the individual in the color, size, and arrangement of artificial teeth.

Mechanical dentistry, a fraction of science which is universal, needs a broad intelligence in its practitioners, and a careful estimate of all which may tend to enlarge our knowledge,—a knowledge not only of the narrow mechanical details, but of all collateral sciences that will contribute to success; but if our patients would exercise the same diligence in the care of their teeth after the dentist's skill has placed

them in order, and would honestly follow his directions as to cleanliness, etc., we would have less occasion to call attention to mechanical dentistry and to urge upon the profession its more thoughtful consideration. But it will be many years before the great mass of the people will so live that perfect dentures will be the rule, notwithstanding the wonderful advances made in the direction of preventing and removing caries of the teeth; therefore the neglect of the mechanical branch in our profession in anticipation of this millennium is worse than folly.

Discussion.

Dr. Atkinson, New York. I was pleased to hear the paper that has been read by your essayist, and I indorse nearly every sentiment that he expressed and the views that he urged. It is true that it is better to have natural organs in good working condition than any substitutes whatever, and it has been the ambition of my life to do what I could in the direction of preserving the natural organs. But however earnest any man may be, it is impossible to so impress the great mass of the human family with the importance of their organs as to have them preserve them against the iconoclasm and wickedness of extracting the natural organs when but slightly diseased. I have been brought to suffer more mental pain from seeing these offenses against nature and their deplorable results than from all other experiences of my life; seeing with what recklessness the teeth of the human family are removed, especially since that lieutenant of his Satanic Majesty, Anæsthesia, made its appearance on earth.

There is one matter mentioned in the paper that I wish were better understood; I refer to the new base of Dr. Reese. I have had a good deal to do with it in the way of investigating it and testing its value, and in my opinion the only difficulty in the way of its being the very best thing that has ever been introduced for the support of artificial teeth is the want of intelligence and faithfulness on the part of those who should know how to manipulate. Any man who is fit to be a mechanical dentist at all will do better with that than with anything else, but the great trouble is the slovenly manner of doing work that the people have forced dentists to adopt for the sake of cheapness.

The great objection to the vegetable compounds lies entirely behind manipulation, and is inherent in the bases themselves. They are not adapted to preserve a healthful condition of the tissues, because their conductivity is so far different from that of the tissues themselves. One cannot wear artificial teeth set upon any of those vegetable bases, that are so low in conductivity of the thermal and electrical currents, and have a healthy mouth, if they are worn continuously. I have seen in my experience in the last year or two cases in which

black rubber was used as the base, where the entire portion of the mucous surface covered by the black rubber was discharging pus. I have never seen either celluloid or rubber worn continuously in the mouth without changing the secretion of mucus to some abnormal presentment, and yet the advice of all the Cheap Johns is, "You need not expect to wear your teeth with any comfort unless you wear them continuously; you must wear them at night." All the tissues need respiration just as much as our lungs, and if you do not give breath to the elements of the tissues, you cannot have health. At every step, from the conversion of food into blood and blood into tissue, all the way through, the molecules that enter into the tissues must have elbow-room in order to effect the molecular changes, and that is what I call the breathing of the tissues themselves.

I have worn two pieces made of this new combination base for over a year, and I never have worn any artificial teeth with as much comfort as I have these; and I suspect that what makes them so comfortable is the fact that the conductivity of the base is nearer to the conductivity of the tissues than is the case with the vegetable bases.

The cases that I mentioned as discharging pus from the mucous follicles of the mouth, the teeth being set on a rubber base, were all partial pieces, and after inserting a Reese metallic base, plated with gold, I had the satisfaction to see in every instance a complete restoration to health. I do not attribute that altogether to the high conductivity of the metal, but also to the fact that I require my patients to leave their pieces out at night, so as to give the gums that had been deprived of their natural elements sufficient time to respire. It is really quite as much of a feat to adapt artificial teeth as substitutes for the natural teeth as it is to restore portions of the natural teeth by filling.

Dr. W. T. Shannon, Brooklyn. I am very glad to see that the Nestor of our profession in the later years of his life is approaching the confines of conversion. The time was when we would not be apt to hear from our worthy brother anything that would savor at all of the removal of the natural teeth and the substitution of artificial ones. I am glad to find that his experience, both with the dentures in his own mouth and from observation of his patients', will now authorize him to advocate, justify, or excuse the introduction of artificial dentures.

I was gratified also to hear the paper read, setting forth the necessity, advantage, and comfort of proper artificial dentistry. The fact is that during the last few months I have had patients who have gone through tortures from dental operations,—delicate, sensitive persons, whose teeth were so sore and whose systems were so susceptible to the slightest disturbance of their nervous organization

that on leaving my office they have been obliged to keep their beds many hours before recovering from the nervous prostration caused by the intense pain of the operations. It has led me to say, almost, that in view of the superior manner in which artificial dentures can to-day be introduced into the mouth and made to serve the purpose of mastication so well as they do, that I would rather have every tooth out of my head than endure what some patients of mine have gone through in the last few weeks. I have had patients with fifteen or twenty-five natural teeth sore and painful, every one of them having a cavity to be filled, with such a diseased condition of the mouth that all the treatment that could be given could only afford temporary relief, and the teeth being so poorly organized, soft, and chalky that every few months they must needs go through this ordeal again. So, as I said, when a set of artificial teeth can be introduced to serve so well the purposes of the natural, I would rather have all my teeth out than submit to what I have put some of my patients through in the last few months.

Dr. Rynear, New York. The point in the paper just read that impressed me more than any other is that the gentleman seemed to think that operative dentistry was held in higher esteem than mechanical dentistry. I may remark that I am very happy to see that it is. It is evidence that we are making a proper advance in the profession, and getting away from what I consider the very dangerous principle that has been set forth, that artificial dentures are preferable to the natural teeth when the latter are properly attended to,—and it is to be presumed that all gentlemen holding diplomas in dentistry are capable of saving the teeth when called upon, except in extreme cases; and where the natural teeth can be retained in the mouth there is no question in my mind but that they should be retained, even when the artificial dentures come as near to the natural teeth in usefulness as we can hope to have them do. There is no question that operative dentistry should be held in much higher esteem than mechanical dentistry, which at best gives us but a substitute for natural organs that have been lost. The man who in the practice of his profession makes it his purpose to save teeth and not to extract them, very seldom has a case come into his hands in which he cannot save the natural teeth. Perhaps it is not universally true now, but with a proper advance in our profession it will be so in future years. It is true now that teeth can be saved when in the most distressing condition. Of course there are cases in which the system is at fault; but where it is a matter of caries only, it seems to be a very criminal act to give out the idea that it is better to extract the natural teeth than to try and save them.

Dr. E. Parmly Brown, New York. I feel that it is necessary to

make an apology for the gentleman from Brooklyn. I do not want that the dentists of New York should be understood by the dentists of New Jersey as holding the sentiments expressed by Dr. Shannon. We regard an artificial tooth as we do an artificial leg, a very good substitute for a lost member, but we would not cut off a leg to cure a corn. It strikes me that my friend must have hunted far to find so many people crying with sore mouths. I cannot find them, and I work in the same malarious district that he does. They do not come to me in that condition. Their teeth can be saved; the most delicate, white, chalky teeth can be saved; all of the thirty-two,—every one of them.

Dr. Stockton, Newark. To my mind there is nothing so grand in dentistry as saving the natural organs. People do not usually value their teeth as highly as they ought; but one gentleman recently said to me that five hundred dollars a year would not compensate him for the loss of a single tooth,—the only one he had remaining in his lower jaw. There are too many teeth extracted. In the lower jaw especially, if you have a good tooth, if it is only a third molar, I say keep it in. Artificial teeth cannot be made to serve as well as natural ones, and there are very few teeth that cannot be saved. There was the case that I reported last year of a gentleman who had the roots of a lower molar fully separated, and one of the roots was loose. I inserted a screw into the solid, good root, put on one of Richmond's crowns, and that tooth is there to-day, and doing as good service as any tooth he has in his mouth. That was as hopeless a case as you would be likely to find anywhere.

Dr. Shannon. I see Dr. Stockton's five hundred and go him five hundred better, on a case that came to me of a lady who had had her teeth filled. They decayed, were refilled, and decayed again; eventually she had them all out. I was not the operator in either case. She had a set of artificial teeth made, and subsequently said to me, "I would not have my teeth back again if you were to give me one thousand dollars. I am a happy woman to-day."

In reply to the gentleman's statement as to how easily the natural teeth can be saved, I will mention a case in point,—that of a patient who was in my office yesterday. The lady has been in the hands of a dentist who is supposed to be one of the best operators in New York City. He did for her some of the most magnificent work ever put in any mouth in that city, yet in about one year afterwards she had five volcanoes belching forth pus and blood. She was in bed for two weeks together. She had her teeth extracted two years ago, and she told me she would not have them back again for five thousand dollars.

Dr. Brown. The cure of a simple abscess is just as easy as picking

your teeth. Place the tooth under favorable conditions, and it cures itself. In nine cases out of ten, on removing the pulp, I fill the roots to the apex without any other treatment whatever, and nature cures perfectly, better than if she was interfered with by the use of painful irritants.

The great mistake we make is in using the forceps on the first tooth and breaking the arch. It should never be done unless it is a crowded jaw. If we only held on longer and searched faithfully, we should find a solution of the difficulty and a means to cure the tooth.

I had a case of a young lady, a very good patient, whose teeth had always been under my care. The right upper second and third molars had been filled properly to the apex of the root with Hill's stopping. A year after I filled them she came to me with her face swelled up and the right eye closed. I found the fillings all right, and I was at sea; I could not diagnose the difficulty. Under treatment the swelling went down, but pus began to exude between the first and second right upper molars. Now, before I go further with the history, I would like to have the case diagnosed from those symptoms. What is your opinion, Dr. Atkinson?

Dr. Atkinson. A foreign substance.

Dr. Brown. Well, I searched for dead bone, but searched in vain. In about six months the patient returned and wanted the teeth extracted. Pus was then exuding between the teeth. I said, "Wait awhile: I don't want to extract a tooth unless I know why, and in this case I do not know." I opened channels again through the apex of the roots, but without relief. I tested the first molar for death of the pulp, and found it was alive. It had a gold filling in. Two or three weeks ago she came to me saying the teeth were very well then, but that there had been two or three attacks of inflammation since I saw her, but that just as she made up her mind to come to me they got well. I shortened the tooth a little, as I had done before, and I made up my mind to solve the problem,—to find out what was the matter. A careful search revealed a fish-bone as long as an ordinary pin. Three dentists had advised extraction, on the theory that there was dead bone there.

Dr. Atkinson. I suspected that something was there which nature was dissatisfied with and was trying to throw out; and so it proved to be, as I said, a foreign substance. Sometimes a natural is converted into an unnatural substance in the tissues. If it had been in soft tissue it could have encysted itself and not been troublesome. Many soldiers carry balls encysted in various parts of the body. But this was something which nature could not encyst and could not throw out. Why? Because it was embedded in connective tissue near the bone. If it had been in the myxomatous or gum tissue it would have

been thrown out or encysted. Dr. Brown struck the right point when he said we should not take out the first tooth except for purposes of regulation. The teeth are like the staves of a cask: when you break up their occlusion they fall to pieces; therefore, that occlusion should not be broken up if it is possible to avoid it. I have to wear artificial teeth, although I have a splendid organization, and there was no necessity for it at all. If we have one duty more imperative than another as dentists, it is to save the natural teeth.

Dr. A. W. Kingsley, Elizabeth. One point pertinent to this subject has not been touched upon at all; and that is the gradual and constant absorption of the jaws that goes on from the time the teeth are lost until the death of the individual. I have given this subject much attention. About thirty years ago a young lady came to me for an upper set of artificial teeth. She had had seven sets made by other dentists and could never wear one of them. She was not over twenty-five years old at that time, and when her teeth were taken out she was sixteen. The jaw had contracted so that I had a great deal of trouble to make a set of teeth that she could wear. Since then I have been very careful about extracting teeth, especially for young persons. A few days since a lady came into my office for whom I had made a set of teeth twenty-five years ago, when she was about seventeen years old. I was obliged to tell her that I could do nothing for her, because her jaw was so absorbed that where once was an alveolar ridge there was now an alveolar depression; there was no chance to insert an artificial denture. All our young patients whose teeth we extract will come to that condition if they live to be old. It is the wickedest thing that can be done to extract teeth that can be saved.

Dr. Watkins. I regard artificial teeth in the same light as artificial legs or arms,—very good things if you are obliged to have them. Why not have your little toe cut off when you have a corn on it? It is of no more use than a wisdom-tooth; if anything, the wisdom-tooth is the more valuable. I think it best to save the teeth whenever it is possible; and if you cannot save a tooth the first time you try, keep trying. I have a case of exposed pulp that I have been treating for three months. I expect to fill the tooth in a few days and that it will be saved.

(To be continued.)

AMERICAN DENTAL CONVENTION.

THE twenty-sixth annual meeting of the American Dental Convention was held in New York City, on August 11, 1880. No business of public interest was transacted, and the convention adjourned subject to the call of the president.

DENTAL ASSOCIATION OF THE UNITED STATES OF AMERICA.

PURSUANT to call, a Mass Convention of the dentists of the United States was held at Republican Hall, New York City, commencing Wednesday, August 11, 1880, for the purpose of forming, as expressed in the call, "a truly national organization."

Dr. R. Finley Hunt called the meeting to order, and on his motion Dr. John B. Rich, of New York, was elected chairman, and Dr. F. M. Odell, of New York, secretary.

A report from the committees appointed to consider the matter of the organization of a new national association was read by Dr. Hunt, submitting the draft of a constitution for the proposed body.

After a long discussion as to the advisability or need of the formation of a new national body, a resolution was adopted that the members of the profession present form themselves into a national dental association. Dr. Rich was made temporary chairman, and Dr. Odell secretary, and the constitution presented by Dr. Hunt was read, section by section, amended where amendment seemed advisable, and adopted. The name of the new association is the Dental Association of the United States of America.

The chief objects of the association are defined to be: The advancement of the profession of dentistry to its proper standing before the world; the procurement of the recognition of dentistry as a profession by the United States government, and the obtainment of its aid and co-operation in the collection and collation of ethnological statistics bearing on the development, structure, and condition of the human teeth. For the purpose of proper and thorough research and investigation, the subjects pertaining to dentistry will be divided and classed as follows: First, Dental Surgery; second, Artificial Dentistry; third, Anatomy and Physiology; fourth, Pathology; fifth, Histology and Microscopy; sixth, Therapeutics; seventh, Materia Medica; eighth, Physics; ninth, Chemistry—organic and inorganic; tenth, Metallurgy; eleventh, Dental Education and Literature. Each of these subjects, according to the plan, is to be in charge of a Section especially appointed for that purpose. A special feature is that each Section is instructed by the constitution to investigate the subject which it has in charge "to the best of its ability," and report the result of its work to the association at each quadrennial meeting in Washington.

Among the more important features is, the division of the United States and Territories into five districts, in each of which, in regular rotation, the annual meetings shall be held, except that each quadrennial meeting shall be held at Washington, D. C. The meetings are to be held as follows: In 1881, First District; 1882, Washington;

1883, Second District; 1884, Third District; 1885, Fourth District; 1886, Washington; 1887, Fifth District. The meetings to be held at Washington are to be as far as possible international in their character. These districts are:

First. New York, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine.

Second. New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, West Virginia, Kentucky, and Ohio.

Third. North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas, and Tennessee.

Fourth. Indiana, Illinois, Iowa, Missouri, Nebraska, Kansas, Dakota, Minnesota, Wisconsin, and Michigan.

Fifth. California, Nevada, Utah, Arizona, New Mexico, Colorado, Wyoming, Montana, Idaho, Washington, and Oregon.

Membership is limited to delegates sent by the various State societies, or to practitioners having the indorsement of the State societies of the States in which they live, except that, in special cases, dentists having the indorsement of five members of this body may be eligible. Members must have received the diploma of a reputable dental college.

All the officers are to be elected annually except the secretary and treasurer, both of whom shall be elected at the quadrennial meetings at Washington, and have their residence in that city. The president and first vice-president, and the assistant secretary and assistant treasurer shall be chosen from the district in which the next annual meeting is to be held, except when the next meeting is the quadrennial gathering, when all the officers may be chosen from the country at large.

New York City was selected as the place for the next meeting, commencing on the first Monday following the first Tuesday in August, 1881.

The election for officers was then held, resulting as follows:

President.—A. L. Northrop, New York.

First Vice-President.—Frank Abbott, New York.

Second Vice-President.—F. A. Levy, Orange, N. J.

Third Vice-President.—J. B. Patrick, Sr., Charleston, S. C.

Fourth Vice-President.—No election—no member present from the Fourth District.

Fifth Vice-President.—No election—no member present from the Fifth District.

Secretary.—R. Finley Hunt, Washington, D. C.

Assistant Secretary.—J. H. Smith, New Haven, Conn.

Treasurer.—H. B. Noble, Washington, D. C.

Assistant Treasurer.—F. M. Odell, New York.

Committee on Finance and Membership.—Frank Abbott, F. A. Levy, J. B. Patrick, Sr.

Committee on Correspondence with the United States Government.—R. B. Winder, Baltimore, Md.; J. Curtiss Smithe, Washington, D. C.; W. H. Dwinelle, New York City; John Allen, New York City; V. E. Turner, Raleigh, N. C.

The secretary and treasurer hold office until the first quadrennial meeting in Washington, when their successors will be chosen for four years.

Adjourned.

SOUTHERN DENTAL ASSOCIATION.

THE Southern Dental Association held its twelfth annual session in New York City, August 12, 1880.

President J. B. Patrick, Sr., of Charleston, S. C., in the chair.

A paper by Dr. T. F. Chupein, of Philadelphia, on "Non-cohesive versus Cohesive Gold Foil," was read, favoring the use of cohesive gold, and claiming that by its more general use in late years many teeth which would formerly have been sacrificed have been saved.

A paper on "Prophylaxis, or Prevention of Dental Decay," by Dr. C. C. Patrick, of Charleston, was read. He recommended special care for the teeth of children, and urged that the use of the brush should be taught as soon as the child was old enough to handle it. Irregularities should be taken in hand and corrected as soon as discovered. Dr. J. B. Patrick, Sr., related an interesting case of mercurial poisoning in a child which had been allowed to play with a piece of looking-glass and had swallowed the coating of amalgam as it was detached by the fingers.

The name of the organization, which was last year changed to the National Dental Association, was again changed, and it will hereafter be known as the Southern Dental Association.

The following officers were elected for the ensuing year:

President.—Dr. V. E. Turner, Raleigh, N. C.

First Vice-President.—Dr. L. D. Carpenter, Atlanta, Ga.

Second Vice-President.—Dr. C. C. Patrick, Charleston, S. C.

Third Vice-President.—Dr. M. A. Bland, Charlotte, N. C.

Treasurer.—Dr. H. A. Lowrance, Athens, Ga.

Corresponding Secretary.—Dr. J. P. Holmes, Macon, Ga.

Recording Secretary.—Dr. E. S. Chisholm, Tuscaloosa, Ala.

Executive Committee.—Drs. T. T. Moore, Columbia, S. C.; J. H. Coyle, Thomasville, Ga.; E. L. Hunter, Enfield, N. C.

Adjourned to meet in Asheville, N. C., the last Tuesday in July, 1881.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE twelfth annual meeting of the Pennsylvania State Dental Society was held at Bellefonte, commencing July 27, 1880. The following officers were elected for the ensuing year:

President.—H. Gerhart, Lewisburg.

First Vice-President.—C. B. Ansart, Oil City.

Second Vice-President.—G. W. Adams, Bristol.

Recording Secretary.—E. P. Kremer, Lebanon.

Assistant Recording Secretary.—W. B. Miller, Altoona.

Corresponding Secretary.—E. B. Long, Pittston.

Treasurer.—Jesse C. Green, West Chester.

INDIANA STATE DENTAL ASSOCIATION.

AT the regular meeting of the Indiana State Dental Association, held in Indianapolis, June 29, 1880, the following officers were elected for the ensuing year:

President.—Robert Van Valzah, Terre Haute.

First Vice-President.—S. T. Kirk, Kokomo.

Second Vice-President.—E. V. Burt, Lafayette.

Secretary.—W. H. Hall, Terre Haute.

Treasurer.—Merit Wells, Indianapolis.

WISCONSIN STATE DENTAL SOCIETY.

AT the annual meeting of the Wisconsin State Dental Society, held in Milwaukee, July 20, 1880, the following-named were chosen officers for the ensuing year:

President.—M. T. Moore, La Crosse.

First Vice-President.—E. Churchill, Columbus.

Second Vice-President.—E. F. Long, Black River Falls.

Secretary.—George H. McCausey, Janesville.

Treasurer.—R. W. Hurd, Madison.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE thirteenth annual meeting of the American Academy of Dental Science will be held in Boston, on Wednesday, October 27, 1880, at 10 o'clock A.M. The annual address will be delivered at 2 P.M. by Dr. Joshua Tucker, of Boston. Dr. Tucker's world-wide reputation and large experience cannot fail to make the occasion both interesting and instructive.

Members of the profession are cordially invited to attend.

C. P. WILSON, *Corresponding Secretary.*

NEBRASKA STATE DENTAL SOCIETY.

THE fourth annual meeting of the Nebraska State Dental Society will convene at Omaha, Tuesday, September 21, 1880, at 7.30 P.M.

W. F. ROSEMAN,
Recording Secretary.

OBITUARY.

ACTION OF THE DENTAL PROFESSION WITH REFERENCE TO
THE DEATH OF DR. SAMUEL S. WHITE.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

THE following resolution, reported by a committee consisting of Drs. J. G. Ambler, W. H. Atkinson, and L. S. Straw, was adopted by the Dental Society of the State of New York:

Resolved, That the Dental Society of the State of New York desires to place upon record its high estimate of the character and qualifications of our much loved friend and brother, Dr. Samuel S. White; that in his death our profession has sustained a great loss; that no one has done more than he to advance its best interests; that no one is more deserving of our esteem and gratitude, and that he has left a record of which our profession may well feel proud.

WISCONSIN STATE DENTAL SOCIETY.

At the session of the Wisconsin State Dental Society held in Milwaukee, July 20, 1880, a special committee, consisting of Drs. Edgar Palmer, W. F. Lewis, Arthur Holbrook, and William Decker, reported the following resolutions, which were unanimously adopted:

Resolved, That we desire to express our sense of loss, and, in common with all other practitioners of dentistry, our deep sorrow and regret over the death of our noble friend and professional benefactor, Dr. Samuel S. White.

Resolved, That this society, at the earliest opportunity, joins in giving expression to its sincere regard for his memory, as one who has endeared himself to the profession through his valuable contributions to it, and his ever faithful and self-sacrificing labors in its interests.

Resolved, That we join in our expressions of honor, love, and sympathy with all who have so appropriately borne testimony to his worth, and offer to his family this heartfelt tribute of condolence in their sad bereavement.

INDIANA STATE DENTAL ASSOCIATION.

At the meeting of the Indiana State Dental Association, held at Indianapolis, June 29, 1880, a committee, consisting of Drs. M. Wells, T. H. Martin, and W. M. Herriott, reported the following, which was adopted:

WHEREAS, We are called to record the fact that death has removed from his active and beneficial life-work our much-valued friend, Dr. Samuel S. White:

Resolved, That we make this record with deep feelings of sadness, knowing that we have lost a true friend, one who was at all times ready to assist in any way in his power those who might need strengthening, that our profession might be advanced in the work of benefiting humanity.

ILLINOIS STATE DENTAL SOCIETY.

At the annual meeting of the Illinois State Dental Society, held at Bloomington, May 11, 1880, a committee consisting of Drs. S. M. Sturgiss, T. W. Brophy, G. H. Cushing, and M. S. Dean reported the following resolution, which was adopted :

Resolved, That the Illinois State Dental Society desire to express their profound sorrow at the death of Dr. Samuel S. White, of Philadelphia, by which event the profession at large has sustained an irreparable loss. His generosity as an individual, and his deep interest in the profession, which led him to advance its interests by efforts tending always to its elevation, both as a science and an art, have endeared him to us in no ordinary degree, and we extend our sympathy to the profession at large as well as to his most afflicted family.

KENTUCKY STATE DENTAL ASSOCIATION.

The Kentucky State Dental Association, at its annual meeting held at Richmond, Ky., June 1, 1880, through a committee consisting of Drs. F. Peabody, W. H. Goddard, and J. Taft, reported the following resolutions, and they were unanimously adopted :

Resolved, That the Kentucky State Dental Association has heard with deep regret of the death of Dr. Samuel S. White, and hereby records its testimony of him as an honorable man and upright citizen, and also conveys to his estimable and bereaved family its sincere condolence.

Resolved, That the association forward a copy of the above under its seal to his family, and record the same upon its books.

MEXICAN DENTAL CORPS.

(Translation from the Spanish.)

At a called meeting of the Mexican Dental Corps held at the residence of E. C. Wise, D.D.S., in the city of Mexico, July 16, 1880, to take action with reference to the death of Dr. Samuel S. White, after an eulogy pronounced by Dr. Wise upon the life and character of the late Dr. White, the following resolutions were unanimously adopted :

WHEREAS, We have received the sad intelligence that Dr. Samuel Stockton White, of Philadelphia, U. S. A., has passed from this life to the Great Unknown; therefore,

Resolved, That the Mexican Dental Corps recognize the eminent and unequalled services that Dr. White has rendered to the Dental Profession throughout the entire world; rendering his name a synonym for dental excellence and perfection.

Resolved, That we most sincerely mourn his loss as irretrievable, and send our most heartfelt condolence to his family.

Resolved, That a copy of these resolutions be forwarded to his bereaved family, and be published in the DENTAL COSMOS, and all other dental publications in the United States and Europe.

MARIANO CHACON, *Chairman*.

EMIGDIO CARRILLO, *Secretary*.

CITY OF MEXICO, July 16, 1880.

W. T. WALLACE, D.D.S.

Died, of brain disease, at Ashtabula, Ohio, June 4, 1880, DR. W. T. WALLACE, in the forty-ninth year of his age.

DR. WALLACE commenced the practice of dentistry in 1858; practiced thirteen years; then entered the dental college at Cincinnati, receiving his degree in the winter of 1871, and again entering practice at Ashtabula, Ohio. He was an active member of both the Lake Erie and American Dental Associations until his health failed. He was deeply interested in scientific subjects and the advancement of his profession. Dr. Wallace was a generous, kind-hearted Christian man, and won the respect of all in the community where he lived. He leaves a wife and two children.

PERISCOPE.

EROSION.—I have alluded to erosion in a general way, but shall now consider cases of a special nature, as developed upon labial and buccal surfaces of teeth; endeavoring by clinical demonstration to illustrate a means of suppressing the oral fluids from the parts to be operated upon where clamps are contraindicated.

Erosion is a synonym of corrosion, and means an eating away. The term, as applied to the dental organs, signifies deficiency of tooth-material, and should not be confounded with caries. This imperfection may be evident at the eruption of the tooth, and is by some ascribed to adverse influences interrupting the nutrient supply to the teeth in their developmental sacs; while others attribute it to the action of acid secretion within the sac. The ulterior ill influence at this period is more of the nature of mal-nutrition than of disease, and manifests itself by horizontal striations and grooves on the buccal and labial surfaces. In other cases the teeth, especially the molars, are pitted over with small holes, or marked with disintegrated spots; these markings will be found to follow the general rule of horizontal striation, and have a tendency to occur in lines. The deficiency is not confined to the enamel, for the dentine in the vicinity of the eroded parts presents layers of "continuous rows of globules of dentine, with their interglobular spaces." The spongy condition of such a formation of the dentine is materially less solid than the normally calcified intertubular substance. The corrugations caused by erosion occur in teeth of synchronous development and eruption, and simul-

taneously with the disfigurement on one side will be found an analogous condition of weakness on the other. This form of erosion is termed congenital, while that which occurs later in life is called accidental. Erosion generally makes its appearance on the vertical walls of the teeth; ostensibly occurring upon the labial and buccal aspects—it being an exception to find it upon approximal surfaces. It is found here, however, as also occasionally upon the linguo-cervical region, presenting inequalities of a parallel elongation, as if an instrument had been drawn across the surface in a direct line with the maxilla, or as if the enamel had been scraped in lines of unequal depth, the section of the tooth presenting a form homologous to that of the edge of the imaginary instrument so pictured. These deformities frequently exhibit themselves in cavities of peculiar shape and greater development. I may specify one of them by describing it as a groove furrowed in the tooth at its cervical region. The section of this groove is triangular at its largest dimension, the side nearest the gum being at right angles to the buccal surface, the other gradually sloping in the direction of the occluding surface. The extension of the angular floor of the cavity being but little removed from a right line, it leaves the surface on either side and has its extreme depth at the protuberance of the tooth, to which surface it forms a chord. The ante-approximal surface of this seat of erosion presents the form of a partial ellipse—a conic section. Another form, much less decided in outline than the preceding, presents a depression, spoonlike in character, but with edges that blend imperceptibly with the general surface of the enamel and cementum. The formation of these cavities may be ascribed to causes extrinsic, as chemical and traumatic; though it is doubtful if erosion is developed in teeth which are not intrinsically faulty. The chemical agents of destruction must be sought for in the oral fluids; but, doubtless, in cases where the teeth are abnormally disposed to disintegration, the ordinary acidulous components of food imperceptibly combine with the morbid tissues, and may result in the formation of cavities similar to those illustrated in the following figures.

The forms of erosion as shown in the diagrams (Figs. 1 and 2), are sometimes produced by traumatic agencies, which of course come under the head of abrasion. Friction from badly adjusted clasps on artificial dentures may simulate erosion; this condition may also be attributed to the excessive use of the brush, or to the impingement of teeth against each other through mal-articulation, which may be original, or produced from causes incident to life,—as loss of teeth, resulting in change of position to those remaining. As the cavity enlarges, it encroaches on territory hitherto occupied by the peridental membrane, thereby causing it to recede. Simultaneously with the retrocession of this membrane, we find the gum receding; the morbid influence causing decay to advance to points beyond the margin of the gum.

Erosion and caries produce similar results, but there is a recognizable difference between the two. Caries may attack teeth of apparently strong structure, and evidences of resistance to disease are manifested by layers of semi-decalcified dentine, which retain with

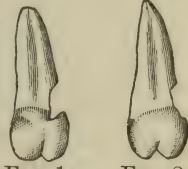


FIG. 1.

FIG. 2.

great tenacity their connection with the normal tissues; but in erosion, portions of the teeth seem fated to complete disorganization, the mal-conditioned parts presenting parietes of highly-polished surfaces, giving an appearance of wear, or cavities designedly made. The pulp, however, sometimes evinces, as in caries, defensive action by the formation of secondary dentine. When erosion occurs at the gingival margin the dentine is usually found very sensitive, and its impressibility may justify therapeutic measures, so as to possibly favor the calcification of the anastomosing canaliculi, which would otherwise remain patulous and subject to varying and destructive influences. With this exception, little can be done with erosion further than to instruct the patient in the methods of cleansing the teeth, as the indiscreet use of the brush may remove tissue, necessitating the restoration of such lost structure. When it is necessary to operate upon a cavity so formed, whether by caries, erosion, or abrasion, I have found the most expeditious, effective, and, on the whole, least painful process to be the use of sharp instruments, with thorough and rapid execution.

The cavity upon which I shall operate this morning—illustrated by diagrams, as well as a plaster model, with the rubber dam *in situ*, which I now pass to the class—shows the difficulties to be contended with in cases of this description. I allude to this with no intention of treating decay in detail, further than to illustrate the application of one of our most valued agents during prosthetic restitution.

Idiosyncrasy, as manifested in some, occasions an additional trouble in the use of the rubber when applied to inferior incisors, by the spasmodic action of the oral orbicular muscle, conjoined with the elevating muscles of the lower lip—the levatores labii inferioris—which sometimes play a most conspicuously tormenting part, by, in a moment, forcing up that portion of the dam reflected over the lip, thereby obstructing from view the scene of operation, and making it exceedingly difficult to continue treatment. This spasmodic action appears in many to be absolutely beyond the power of control, and is due, no doubt, to the susceptible influence of irritating causes.

As a sequence, where these involuntary contractions of the mouth occur, an excess of the salivary fluids may generally be expected. Obedient to the sympathetic action of nerve irritation, copious exudations of a viscid character flow from the glands into the oral cavity, filling it with a muco-gelatinous effusion that barely finds escape through the saliva ejector.

The effective adjunct just mentioned prevents overflow from the commissures of the lips of the accumulated secretions, with its attendant train of annoyances.

In adapting the rubber it is important to accurately calculate the distance intervening between the teeth, in order that corrugations formed by excess of the material may not encroach upon any portion of the structure intended to be operated upon. For if the perforations be made too far apart, the rubber intermediate between the teeth will form convolutions and radial eminences, obstructive to the objective point at which attention is engaged. Again, should an insufficient space be left between the apertures, the work will be jeopardized, or at least delayed, by the seeping in of moisture upon the filling; while if the holes be cut too small, difficulty will be experi-

enced in endeavoring to place it on the teeth without tearing. The other extreme, that of cutting them too large, may be considered quite as dangerous, for, in that case, the rubber will fail to contract upon the teeth to an extent sufficient to exclude all moisture.

The illustration which I now pass to you shows the average three sizes of perforations required when using rubber upon laterals, bicuspids, and molars of ordinary dimensions; exceptional cases, of course, requiring special adaptation.

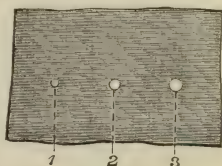


FIG. 3.

For example, when placing the dam on three teeth, the central perforation being applied without tension to the intermediate tooth, the remaining apertures will fall in the vicinity of the approximal surfaces. The first extension carries the holes to the medial point of the crown of each of the three teeth in question, and is made at the expense of the rubber lying in a line with the maxilla, resulting in a proportionate elongation of the holes themselves.

This extension is then supplemented by another perpendicular to the first, which, conjoined with compressing the rubber on the tooth, enlarges the apertures at the expense of the elastic material (1st) on the sides embracing the lingual and buccal aspects, and (2d) between the teeth. The portion so expanded is limited to a circumscribed area of distention, and is almost wholly expended in the formation of a rim round the tooth, which may be designated a collar. As the compression passes over the tooth the circumferential edge is retarded, and forms a collar inverted in the opposite direction to that required. This is remedied, however, by carefully working the edges of the rubber upon the cervical portion of the tooth and underneath the gum until it forms a matrix, involute in shape, between the hard and soft tissues. The effect of the extension of the rubber is to cause it to invade the greater portion of the interdental regions; but if the mutual distances of the perforations have been carefully estimated, a neutral line will be left, which, although affected by the general distention in length, has not sufficient tension to draw the dam away from the adjacent teeth, thereby causing apertures for the intrusion of moisture. On the selection of the rubber much will depend as to the comfort and convenient manner in which the operation may be performed. If too thick, the collar will not be easily reversed in its position and carried to the point desired; besides it greatly complicates matters by an excess of material which must necessarily encroach upon territory that should be left free. On the other hand, should the rubber be too thin, the power of the distended portion would be so abridged as to diminish the collar in size, and consequently its tenacity in resisting the aggressive fluids; also, the substance of the material between the teeth would be so attenuated that the slightest miscalculation in leaving a deficiency between the original perforations would greatly aggravate the case.—*Clinical Lecture by W. Finley Thompson, M.D., D.D.S., at National Dental Hospital, London; Monthly Review of Dental Surgery.*

(To be concluded.)

THIRTY-FIVE YEARS' HISTORY OF A MAXILLARY TUMOR.—Mr. Heath gave the following history of a maxillary tumor: The patient,

æt. sixty-seven, when he first came under his notice in 1877, was a healthy country gentleman, who said that as long as he could remember there had been some enlargement of the right side of the lower jaw. In 1845 this enlargement increased considerably and very rapidly, and in 1847 Sir William Fergusson removed a tumor of the right side, sawing through the ramus horizontally, and the body of the jaw close to the right canine tooth. The tumor was apparently of a fibroid character, having a large cyst developed in it. He continued in good health for fifteen years, and then noticed the formation of a cyst in the incisor region, which had frequently been tapped by Sir William Fergusson. In July, 1877, Mr. Heath found cystic disease of the left side of the body of the jaw extending to the molar region, and operated by extracting all the teeth, and opening up the cysts freely, and clearing out some solid growth with the gouge. From this the patient made a good recovery with considerable consolidation of the bone; but in the November following one cyst was found to have developed anew in the incisor region, and this was treated in a similar manner. A year later a fresh development of cysts had taken place, and the operation was repeated with a good result, so that in February, 1879, the jaw was completely consolidated, and the patient was advised to have some artificial teeth fitted. In November, 1879, the patient reappeared with a large solid tumor involving the left side of the body of the jaw, which, noticed first in June, had grown rapidly of late, and now involved the skin for an area of a square inch. On December 2, Mr. Heath removed the tumor by sawing through the bone immediately in front of the left masseter, and also removed a piece of infiltrated skin from the left of the median line. The wound was brought together with barelip pins and sutures, and only one artery (facial) was ligatured. The patient made an uninterruptedly good recovery, and soon gave up the use of a feeder and took food with a spoon, and was able to talk intelligibly after the first week, although deprived now of the entire body of the jaw. The lower end of the wound, being left open, afforded a thorough drain for discharge, and the mouth was, moreover, easily kept clean. The parts rapidly contracted, and he was able to leave London the first week in January, 1880. The patient returned early in February, when the skin near the wound was found to be increasingly infiltrated, and a tumor of the size of an orange was found beneath the right deltoid. He had strained the right arm in getting into a hip-bath, but was quite clear that the humerus had not been struck. The tumor was painful, but the bone was sound, the head moving with the shaft. A week later the patient was found to have a tumor in the pelvis pressing upon the rectum, and springing from the interior of the right innominate bone. From this time he gradually lost strength, and died at the end of March. The second tumor was pronounced by Mr. Doran to be a round-celled sarcoma, and the same growth was found in the piece of skin which was removed. The earlier tumor, which had been preserved in King's College Museum, was too much altered by long immersion in spirit to allow of minute examination, but appeared to be a fibroid or spindle-celled sarcoma. No post-mortem examination of the internal growths could be obtained. Mr. Heath remarked upon the great interest of the case, and its important bearing on the treatment of cystic disease

of the lower jaw. Hitherto cystic disease of the lower jaw had been regarded as a local ailment, and the treatment by clearing out the cysts and crushing in their walls had given good results. In this case more than thirty years had elapsed between the formation of the two growths, and in the interval cystic disease had been largely developed. Mr. Heath then alluded to the female patient he had previously shown, who had been under his care for the last five years, and in whom he had twice operated by breaking down the cysts with good results, but in whom there was now considerable thickening of the jaw, but no distinct tumor. He concluded by contrasting cancerous with sarcomatous tumors, showing that the former invade the lymphatic and the latter the venous system, and hence the secondary tumors in various parts of the body.

The president (Mr. Cattlin) said the case just described by Mr. Heath was, he thought, an example of specific disease. There were three distinct cysts, and considerable deposit of solid matter, and its malignant character was shown and proved by metastasis to the pelvis. The patient shown appeared to him to be suffering from disease which was following a similar course. With the exception of dentigerous cysts, the most common form of disease of the lower jaw was a single cyst which expanded the walls and produced absorption. Such growths were generally innocent.

Mr. S. Cartwright was inclined to think that cystic tumors more often had their origin in the teeth than was generally supposed, the peculiar connection of the teeth with the jaw favoring this hypothesis. In many cases the cysts were probably congenital and formed in connection with the primitive sac of the tooth.

Mr. Hamilton Cartwright said that the character of the tumor Mr. Heath had just described was evidently not of the odontomatous or dentigerous kind, although a cyst existed in the sarcoous elements of the tumor. He believed that such growths were of dental origin, sub-acute, not acute, inflammation of the root being the first origin of the evil. As a result, lymph is thrown out around the root, or even beneath the external periosteum of the maxilla: this lymph, if not absorbed, becomes organized, and a tumor, sarcomatous, osseous, or of the two structures combined, is the result. The moral to be deduced was that dentists should have a good surgical knowledge, and know when it may be more dangerous to save a tooth than to remove it.—*Transactions Association of Surgeons practicing Dental Surgery, in Medical Press and Circular.*

PECULIAR SUPPURATIVE DISEASE OF JAW.—The president narrated the following case. The patient, a gentleman, formerly lived in New South Wales, and about twenty-five years ago suffered from "sun-stroke;" he was very profusely salivated, but recovered his health, married, and returned to this country. In a letter, dated September, 1872, he said that five years previously he had a very severe attack of neuralgia in his head and face, which continued with more or less violence for about five months, coupled with intense nervous excitement. He took alteratives in the form of calomel and colocynth in small doses, black draughts, and occasionally Dover's and James's powders. At the same time he had a carious bicuspid tooth, which could not be extracted. After some time he tried change of air, and the pain was very much alleviated, but became chronic. Having an

idea that the drainage of the village was defective, he left the neighborhood, and went to the neighborhood of Horsham in March, 1870. At Christmas, 1871, he had a sharp attack of what seemed to be "suppressed bile." The medical man prescribed the same remedies that he had always taken; but two weeks afterwards he began to feel a metallic taste, the gums all became spongy, and his teeth loose in the upper jaw. Pus formed rapidly, and culminated in an abscess on the right nostril, which was opened, but afforded relief only for a short time, as matter and bony substance continued to be thrown off. For fifteen years he had led a steady life, with nothing to complain of except occasional dyspepsia. When Mr. Catlin first saw this patient a thick creamy discharge was passing from beneath the gums around the necks of the teeth in the upper jaw. The disease very much resembled one described in Wood's "Practice of Medicine," and, as far as his experience went, was generally incurable. Perhaps it yielded more readily to the electric cautery, or chloride of zinc, than to any other treatment. The discharge was thicker than healthy pus, and different in color; it oozed rather than flowed from the alveolar process, and required slight pressure to remove it from beneath the gums. This kind of discharge, coupled with some inflammation of the gums, continued for many weeks, accompanied by distressing pains and neuralgia, until necrosis of the alveolus took place, and healthy teeth with parts of their sockets were removed. Nearly all the teeth in the upper jaw were lost in this way, and the gums then became healthy. There was no history of syphilis, but the patient lived in neighborhoods where either the drainage or water was not good, and seemed to have been peculiarly susceptible to the action of mercury. Since he was under Mr. Catlin's care he had suffered from paralysis of the right side and epileptic fits, from which he was now recovering.—*Proceedings of Association of Surgeons practicing Dental Surgery, in British Medical Journal.*

SUDDEN AND TRANSIENT SWELLING OF BOTH LIPS AND TONGUE.—On the evening of the 26th of June, Mrs. S. came rushing into my office with her infant son, aged ten months, who presented a hideous and ridiculous appearance: both lips, enormously enlarged, standing out stiffly, and the swollen tongue projecting almost motionless between them. The lips were not tender and pressure did not cause pitting, and there was only a trifling degree of redness of the integument. The infant did not exhibit any signs of pain. A large quantity of saliva was continually overflowing. The preponderating symptom was the immense swelling. The mother positively stated that no injury had occurred, and that the whole condition as above described had occurred in a period of half an hour before calling at my office. The child was unable to grasp the nipple or swallow from a teaspoon.

I have only to add that the swelling soon after began to subside, and in less than twelve hours the enormous distention was all gone, and the parts restored to their natural position, size, and shape. No treatment was pursued except the application of very weak lead-water, to satisfy the mother.—*A. I. Lawbaugh, M.D., in Boston Medical and Surgical Journal.*

HINTS AND QUERIES.

"He that questioneth much shall learn much."—BACON.

CORRESPONDENTS desiring a reply in this department are requested to make use of *distinctive signatures or initials*, and avoid the practice of signing their communications Reader, Subscriber, etc.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names. We cannot insert queries or replies except they are so accompanied. Names not necessarily for publication.

WILL some one point out the difference between an ulcerous tooth and one that is affected with an abscess?—I. D. T.

DR. FRANK ABBOTT, in the DENTAL COSMOS for August, 1880, says that Dr. C. F. W. Bodecker "claims that the dentinal fibers first described by Tomes, Sr., are formations of living matter." What is that "living matter" and what is its source? Is it a kind of protoplasm pervading the dental organs, but differing slightly from other kinds supplying other organs? Will Dr. Abbott or Dr. Bodecker give us a little information on this interesting subject?—T. D. I.

I NOTICE in "Hints and Queries," in July DENTAL COSMOS, that L. P. has come to the conclusion that unclean burnishers are in a great measure the cause of the discoloration of gold fillings. Now, how can that gentleman reconcile his views with my experience? I do not use a burnisher at all, but finish with strips of sand-paper, pumice-stone, rotten-stone, and whiting on tape in the order named, thus producing a beautiful finish. Yet the fillings will discolor. Sometimes one or more of a number in the same mouth, and inserted in the same manner, on the same day, and from the same book of gold. I sometimes find that, of two contiguous fillings introduced as stated, one remains bright while the other becomes discolored. I speak of approximal and labial fillings, as I rarely have crown fillings change. Are we not all at sea as to the cause of the above trouble?—WM. J. HEWES.

REPLY TO W. P. G., in August number.—I would first be sure to get a *good impression*. To do this I would take plaster and mix it very thick, and use only enough for the purpose, and press it *well up* back, and all around, except upon the "hard spot" he speaks of. After removing from the mouth, scrape the posterior portion slightly, where the "spongy membrane" seems the thickest. This will afford a foundation to the plate to balance the "hard spot" in the anterior part of the mouth. In mounting the teeth, I would put the least possible amount of material in his mouth, using as *thin* teeth as the case will admit of. I would make no "plumpers," and have as little plate-material under the lip and cheeks, on the outside of the alveolar border, as possible, and set the teeth perpendicularly over the ridge in such manner as will throw the "leverage," if any, *against* the palate rather than *from* it. Let the edges of the vacuum cavity be sharp and well defined. In setting the teeth, however, care must be taken not to cramp the tongue. The thinner the plate the better.—G. W. A.

W. P. G.—Before taking the impression, cut out a piece of tissue paper the size of the ridge in the mouth, and place it upon it. Take the impression, being careful to take high up on the alvéoli, particularly at the tuberosities. After removing the impression, mark where the paper adheres to it, and cut out a thin chamber, a little larger than the ridge, mark the outside of the alveolar ridge as high as possible, and trim at the tuberosities a beveled edge, and also under the nostrils, for the mouth is probably soft at these points. Do the same at the palatal portion. Trim until you think you have enough, and then a *little more*, and if your impression is good, you will have a fit with any plate.—NOYES.

REPLY TO W. H. I., in June DENTAL COSMOS.—If he will keep about an ounce of mercury in the solution with the battery zines, they will always remain amalgamated.—CARL.

REPLY TO G. A. F., in July DENTAL COSMOS, as to the best remedy for soreness of the gums after extraction. The best remedy I have ever found is tincture of arnica, either in full strength or diluted to suit the condition of the mouth of the patient. After the first application, I anoint the gums well with a preparation of camphor, which recipe the readers of the DENTAL COSMOS can have by addressing Box 132, Washington, Iowa (inclosing stamp for reply). With this treatment I have never known a particle of trouble; even in twenty years' practice.—CARL.

TO REMOVE TIN FOIL FROM RUBBER DENTURES.—Place the denture in a covered glass dish (the acid holds its strength longer when covered) containing dilute nitric acid. Let it remain in the acid about ten minutes, then remove, wash and brush it, and it will have a polished surface. Let the acid remain in the dish for future use; when it ceases to act upon the tin foil, the addition of a few drops of strong nitric acid to the solution will make it as active as at first.—C. F. L.

IN "Hints and Queries" for July, J. Guttman states that he agrees with Dr. N. W. Kingsley that the cause of the sore mouths we occasionally meet with where rubber plates are worn is due to the impossibility in ordinary hands of keeping them absolutely clean, and he (Guttman) says he can point out the reason, which is that not one set in twenty is properly hardened in vulcanizing, and consequently the polish wears off easily; that to keep such a set clean is impossible; therefore, a set of teeth vulcanized at 320° for fifty-five minutes is not fit to enter anybody's mouth. On the other hand, a plate well hardened and highly polished can be kept clean as easily as a gold set. But he leaves us in the dark as to what degree of heat and what length of time is best to vulcanize a set properly.

I agree with him that the cause of sore mouths is due in a measure to the plates not being kept clean; but the fault is due in most cases to the wearer, I think, rather than to the dentist. I vulcanize at 320° for fifty-five minutes, according to directions, and I do not have any trouble with the polish wearing off. I think one cause of sore mouths is due to the rubber being a non-conductor, and therefore heating to the mouth. This is my greatest objection to rubber.—F. I. W.

A NEW REMEDY FOR "RIGGS'S DISEASE," SO CALLED.—Whether the ulcerating pericementum is confined to one tooth or to a number of teeth, and is produced by no matter what cause, proceed first, with a stiff hoe-shaped excavator that will pass freely under the detached gum and alveolus, to scrape the root of each affected tooth clean of all tartar and roughness, and wash away the *débris* with Farrar's abscess syringe. The remedy is chloride of zinc and alum, prepared and used as follows: Drop bits of zinc into a wide-mouthed bottle half full of muriatic acid until the bubbling ceases, and you have muriate or chloride of zinc. To this add as much finely-pulverized alum as it will dissolve; saturate a loose pellet of cotton with the remedy, and carry it with a suitable instrument between the gum and root wherever detached, even if it is to the apex of the root; but do not let the cotton remain. Repeat the application in this manner every third or fourth day. My success with it so far seems to justify my faith in it as the curative agent for ulcerating periosteal and epithelial tissues.—J. L. MEWBORN.

THE
DENTAL COSMOS.

VOL. XXII.

PHILADELPHIA, OCTOBER, 1880.

No. 10

ORIGINAL COMMUNICATIONS.

THE PATHOLOGY AND TREATMENT OF EPULIS.

BY N. SENN, M.D., MILWAUKEE, WIS.

(An Address Delivered by Invitation of the Wisconsin State Dental Society, during its Annual Session in Milwaukee, 1880, and published by request of the Society.)

It gives me great pleasure to meet with you on this your tenth anniversary as a society, and I take advantage of the opportunity to congratulate you upon the success attained by this organization, as well as the high rank your profession occupies in the esteem of the people here and abroad. You may well be proud of the reputation and distinction achieved by your profession. The fame of American dentistry is world-wide. American dentists are sought and patronized everywhere. Your profession furnishes a fertile field for the exercise of ingenuity and the application of mechanical skill, which constitute such a prominent and characteristic feature of our people.

When, a few weeks ago, I was honored by an invitation to appear before you this evening, I fully realized the responsibility I was assuming in accepting it. It is no easy task for an outsider, although belonging to a kindred profession, to come before such an intelligent audience and offer something that shall be of sufficient value and interest to merit its attention. After mature reflection, I have concluded to call your attention to a disease which occupies the boundary-line between the dentist and surgeon,—an affection which, for its successful management, requires the services of both. I allude to Epulis.

The term epulis is derived from two Greek words, signifying "upon the gums." The ancients applied this word to designate a variety of tumors found in and underneath the gums. The designation originated at an early period in the history of medicine, when the locality and external appearances of a disease received more at-

tention than its pathology. Like many other vague and indefinite terms, it has been handed down to us from the distant past through the current of medical literature, and at the present time occupies still a position, although in a modified form, in most of our text-books.

In speaking of malignant diseases of the bones, Billroth says,* "Some also call epithelial cancer epulis; it is well either not to use such terms, or to restrict them by certain adjectives, as sarcomatous, fibrous, carcinomatous epulis, etc."

This affection is no longer considered a primary disease of the gums; it includes no longer the variety of inflammatory, hypertrophic and malignant processes which originate in the gums or the neighboring tissues. The term epulis is still giving rise to considerable confusion, as authors continue to apply it to different pathological conditions. As used in the present sense, we understand by it a fibro-plastic tumor, which originates in the endosteum or periosteum of the alveolar process, which manifests a strong disposition to return if not thoroughly removed; and which never heals spontaneously, but seldom invades the system by general infection. Epuloid growths may therefore be appropriately classified under the head of semi-malignant,—a class of tumors prone to local but not to general infection.

Clinical History.—The clinical history of all epuloid growths demonstrates the fact that they have a certain relation to the teeth, in the proximity of which they always take their origin. These tumors never occur in jaws which have no teeth, nor in parts of jaws where the teeth have long been removed.

Mr. Salter gives a case which at first sight seemed an exception to this rule: "One of the most severe examples of this malady which I have seen consisted of a bilobate mass, the size of a walnut, extending on the right side of the lower jaw, from the dens sapientiæ to the canine teeth, the four intermediate teeth having been removed. Its removal on this occasion disclosed the remains of one fang of the first molar tooth in its very axis. This was extracted, and the disease did not again make its appearance."†

Infants and the aged, with edentulous and atrophied jaws, are exempt. The youngest patient that has come under my observation was eighteen, and the oldest fifty-five years of age. The disease is most frequently met with in persons from twenty to fifty years of age. In a table of 28 cases observed in the London hospitals, the youngest patient was a boy of nine, whilst the oldest was a woman of seventy-three. Five were under the age of twenty, eight between the ages

* General Surgical Pathology and Therapeutics, p. 602. New York, 1872.

† Holmes's System of Surgery, vol. iv. p. 340. New York, 1875.

of twenty and thirty, seven between thirty and forty, three between forty and fifty, two between fifty and sixty, and three above sixty. The average age of the whole number is thirty-three.*

Females suffer more frequently from this disease than males, the relative number among my cases being in the ratio of 3 to 1. This disproportion is explained by the well-known fact that females suffer more frequently from diseased teeth than males.

A discrepancy of opinion prevails in regard to the relative frequency with which the lower and upper jaws are affected. Erichsen has met with it more frequently in the lower jaw, while Pollock's experience has been the reverse, having had twice as many cases where the upper jaw was the seat of disease as where the lower was affected. I have seen it more frequently in the lower than in the upper jaw.

Inasmuch as the anatomical structures surrounding the roots of the teeth are the same in both jaws, we can safely assume that were all the cases tabulated, there would be no great disproportion in regard to the frequency with which these bones are affected. The difference in the statistics of individuals must be considered as accidental. The disease affects more frequently the sockets of the molars than the incisors and canines, and is attached more frequently to the outer than the inner alveolar process.

The starting-point of an epulis is usually in one of the alveolar cavities; as a rule only one tumor exists. As the neoplastic formation increases in size, its pressure soon produces displacement of its surrounding structures. One of the first results of this pressure is a loosening of the teeth around which the growth develops itself, and a dilatation of the alveolar spaces. The tumor projects in the direction which offers the least amount of resistance, which is usually between a tooth and the outer alveolus, or between two adjacent teeth.

The progress of the disease is slow and painless. Probably the first thing the patient will notice will be a preternatural prominence of one or more teeth, which eventually become loose; and this fact induces the patient to consult a dentist for the purpose of having them extracted. At this stage, besides the loosening of the teeth, a firm fibrous growth is found around the base of the tooth first affected, and usually more prominent between, and to the outer side of, the teeth. The mucous membrane covering the tumor presents a natural appearance, and rarely is the seat of ulceration, unless the tumor has acquired a large size, or its surface has been subjected to mechanical injury. If the base of the tumor remains circumscribed, the dis-

* Heath, *Injuries and Diseases of the Jaws*, p. 204. London, 1872.

ease manifesting no tendency to invade the adjacent alveoli, then the growth projects into the cavity of the mouth and assumes a pedunculated or polypoid shape. The shape of the tumor is determined, to a certain degree, by the extent of its base, and the pressure to which it has been exposed on part of the surfaces with which it comes in contact. The consistence of the tumor is variable, and depends upon the abundance or paucity of its fibroid elements. The rapidity of its growth depends, in part, upon the character of the cells which constitute its principal bulk. The more closely the tumor resembles a purely fibroid structure the firmer its consistence and the slower its growth; if, on the other hand, the myeloid cells preponderate, then it is very vascular, soft, grows rapidly, and is more prone to ulcerative destruction.

As the tumor increases in size it becomes more or less lobulated, the number and shape of the lobes depending upon the resistance with which it meets and the arrangement of the fibrous stroma in its interior. As long as its investing membrane remains intact there is no tenderness, and the surface does not bleed on being touched; when ulceration takes place the abraded surface often becomes tender, and the source of frequent debilitating hemorrhages. The chief inconvenience arises from its presence when its size is sufficient to interfere with the functions of the mouth, speech, mastication, and deglutition. If the tumor is permitted to grow to a large size it will produce external deformity of the face.

Mr. Liston removed an enormous tumor of this kind from the upper jaw of Mary Griffiths, in October, 1836.* The disease had existed for eight years. An operation was performed when the tumor was of small size, but the disease returned owing to an imperfect removal of the morbid product. The tumor belonged to the fibroid variety. The growth primarily took its origin from the sockets of the incisor and canine teeth of the left side of the upper jaw. It early protruded from the mouth, pushing the lips and cheek before it. It filled the cavity of the mouth anteriorly, and formed a large tumor in front of the face, and was the cause of great inconvenience and suffering. Ulcerations had taken place over some parts of the surface, but its other qualities indicated a benign nature. An operation performed for its removal restored the symmetry of the face, and was followed by complete and permanent recovery.

Dr. Kinloch, of Charleston, S. C., performed a similar operation in 1869. The patient was a negress, aged twenty-five, who suffered from a tumor originating from the same locality, and having attained about the same dimensions. It had originated in the alveolus, but

* Heath, op. cit.

had involved a considerable portion of the superior maxillary bone. The mass, after removal, weighed nearly two pounds, and the patient made a good recovery.

It is difficult to estimate the natural duration of this disease, as the patients suffering from it readily submit to an operation before it endangers life by interfering with essential functions. In the table of 28 cases previously quoted, the longest period mentioned was twenty years, in a patient of sixty, and the shortest three months, in a patient of fifty.

The disease remains local, and destroys life only if it is permitted to attain sufficient size to interfere mechanically with alimentation or respiration.

Causes.—Our knowledge concerning the essential cause of epulis is absolutely *nil*. The disease does not appear to be hereditary. We are ignorant regarding any special general condition favorable to its development. There is no evidence of the disease being the result, or a manifestation of, a general condition or dyscrasia.

Prof. Rust believed that these growths, in some instances, are caused by a general dyscrasia, and in support of this assertion he relates a very singular case that came under his observation.* A woman suffered from a sarcomatous epulis during her pregnancy. The tumor was attached to the alveolar processes of the upper jaw; it presented a reddish-blue appearance, and at times gave rise to copious hemorrhage. Repeated fruitless attempts were made to destroy it by means of the ligature and caustics. Soon after delivery it disappeared spontaneously. It reappeared regularly during four successive pregnancies and disappeared promptly after each delivery, without treatment, so that the woman began to look upon its appearance as the most reliable indication of her condition.

The immediate or exciting cause is in many instances referable directly to a local irritant, as a diseased tooth. When the jaw is devoid of teeth at the site of disease it may be safely assumed that a root or a loose spicula of bone is buried somewhere in the interior of the mass. Incrustation of tartar around the base of the teeth has undoubtedly in some instances acted as a cause, and it is only reasonable to presume that the prolonged irritation incidental to the second dentition and the appearance of the last molars has been instrumental in originating the morbid process. It is a well-known fact in pathology that any long-continued irritation may so alter the nutrition of normal structures and benign growths as to impart to them a semi-malignant or malignant type.

* Aufsaetze, u. Abhandlungen aus dem Gebiete der Medizin, Chirurgie, etc. Berlin, 1834. Band i. p. 263.

Mr. Stanley,* in speaking of malignant disease of the periosteum, says, "The grounds upon which I have considered this to be a disease of the periosteum are, that in some instances the fungous excrescence appeared to have arisen directly from the periosteum, altered in structure by inflammation, that is, thickened and softened, and but loosely adherent to the bone; further, that these alterations in the periosteum have been observed to extend beyond the limits of the fungus, and indeed far beyond the existence of any change in the skin indicating unsoundness of the subjacent parts. Thus, in one case where the fungus was confined to the lower third of the front of the leg, the periosteum was found preternaturally vascular, thick, soft, and pulpy over the whole of the tibia and upon the fibula also. It seemed, therefore, from these observations, that a diseased state of the periosteum had preceded the growth of the fungous excrescence on it."

Traumatic injury of the teeth or alveolar processes, the excessive use of phosphorus and mercury, deserve to be enumerated as possible causes; in fact, I believe that any cause or causes which produce a prolonged and continuous congestion of such vascular membranes as the endosteum and periosteum of the alveolar plates may eventually engender this disease.

Pathology.—Epuloid tumors, as described above, belong to a class of tumors which have been described under different names as fibroplastic by Lebert, sarcoma by Virchow, and myeloid by Paget.† The term fibro-plastic defines their structure and clinical behavior better than any other which has been proposed, and should be retained until a more accurate knowledge of their essential nature warrants us in adopting something better. On section, the tumor appears smooth, and presents usually spots of discoloration varying from a bright pink to a dark brown. This mingling of colors is one of its characteristic properties. In structure it is composed of spindle-shaped fibro-cells, and larger polynucleated and nucleolated cells. (Riesenzellen.) The spindle-shaped or caudate cells contain single nuclei and nucleoli; the large cells are irregular, round, oval, or flask-shaped, measuring from $\frac{1}{800}$ to $\frac{1}{1000}$ of an inch in diameter, and contain from two to ten distinct nuclei with nucleoli. The fibro-cells consist of an abnormal increase of the fibrous elements of the organs from which the tumor made its starting-point; while the larger or myeloid cells, lodged in varying proportions in its meshes, comprise one of its products, and impart to it its semi-malignant properties.

When a tumor is largely composed of these giant-cells it grows

* A Treatise on Diseases of the Bones, p. 281. Philadelphia, 1849.

† Paget's Surgical Pathology, p. 544. Philadelphia, 1870.

rapidly, is soft and vascular, and very prone to infiltrate and infect the tissues around it. The neoplastic deposit penetrates the bones by dilating the Haversian canals and following the fibrous tissue lining these channels.

Mr. Paget says of these tumors, "In all these characters of connection the fibrous tumors on the exterior of the jaws and about other bones resemble outgrowths; they are as if some limited portion of the periosteum had grown into a tumor overlying or surrounding the bone. The character of outgrowth is indeed generally recognized in the epulis, or tumor of the gums and alveoli, but I believe Mr. Hawkins is quite right in the view which he has expressed that the fibrous epulis should be regarded as a tumor growing like most of the fibrous tumors from the bone and periosteum, and continuous with them. That it is prominent and lobed is because it grows into the open cavity of the mouth, and it resembles gum only because it carries with it and involves the natural substance of the gum."*

The mucous membrane covering the tumor is intimately connected with its substance, presenting no distinct boundary-line. The tumor is connected primarily with the endosteum or periosteum of the alveolar processes, and Otto Weber† has traced its origin to the pulp of a tooth. The bone to which the tumor is attached becomes very vascular and osteo-porotic, portions of its substance being absorbed, and the space appropriated by the neoplasm. Deposits of bone are frequently found in the interior of these tumors. It has been a question among pathologists to determine whether the bone thus found is derived from the alveolar processes, or whether it originates *de novo*,—a product of the tissues.

Luecke‡ believes in the osteo-genetic functions of the neoplasm, when he says that the main feature of a periosteal sarcoma does not consist in this or that form of cells, but that it depends upon its proneness to produce bone or a substance resembling bone. Mr. Tomes,§ on the other hand, takes it for granted that the bones found in these tumors are detached pieces from the jaw, and during their growth are imbedded in their substance. He thinks that its microscopic character "fully justified the assumption that it had at one time formed a portion of the subjacent alveolus, and that its detachment had been effected by absorption; and further, that when so detached it had formed a source of irritation, and thus led to the development of the epulis."

* Opus cit., p. 488.

† Verletz. u. Chir. Krankh. des Gesichts. Pitha und Billroth Chirurg, p. 270.

‡ Die Lehre von den Geschwuelsten, p. 179, Pitha und Billroth.

§ Dental Surgery, p. 521.

Stanley, Jonathan Hutchinson, Heath, Hawkins, and De Morgan have each removed epuloid growths of large size, with bony deposits at a distance from their point of origin, so that there can be no further doubt that ossification had taken place in the tumor itself. These tumors possess a great amount of vitality and power of resistance. They are seldom (especially the fibroid variety) the seat of ulceration, and when this occurrence takes place it does so only when the tumor has attained a large size, or as the result of extraneous causes.

Enlargement of the lymphatic glands does not belong to the clinical history of epulis. In the few cases where it was alleged that the disease became general, the secondary deposits were found, not in the lymphatics, but along the course of the blood-vessels.

Diagnosis.—The clinical history and the physical appearances of the tumor furnish the most important facts in arriving at a correct diagnosis. Should any doubt remain, it may be effectually dispelled by a microscopical examination of small particles taken from the interior of the tumor. The absence of pain or tenderness, the slow growth, the firmness of the tumor and its attachment within or in the immediate vicinity of an alveolus, are conditions which belong to the history of every case of epulis. Hypertrophy of the gum is an exceedingly rare affection, and the morbid process never extends beyond the tissues primarily involved. Granulations or polypoid growths from the cavity of a tooth or an alveolus are soft, bleed easily on being touched, and are therefore not liable to be mistaken for an epulis.

Parulis, or abscess of the gum, is an acute affection, and always terminates in suppuration. In scorbutus we have an inflammation of the gums and the alveolar contents, which, if limited, might resemble the disease under consideration; but the disease is usually distributed over a larger surface, and the history of the case furnishes evidence of the presence of causes which have given rise to a general dyscrasia. Cartilaginous and osseous tumors of the alveolar processes present such characteristic features as to offer no difficulties in view of a differential diagnosis. Epithelial cancer is not a primary affection of an alveolus, but affects this locality by extension, usually from the lips. This affection attacks persons only advanced in years. It does not give rise to a tumor, properly speaking, but falls an early prey to destructive ulceration. Lymphatic infection is a constant occurrence in cancer, but is seldom or never present in uncomplicated cases of epulis.

Prognosis.—The repullulating disposition of epulis constitutes its most formidable feature. This affection, as a rule, comes under treatment earlier than most any other variety of tumors on account of its location and the inconvenience it occasions. Its slow growth and its

local nature render it a favorable object for operative procedure. Prof. Gross,* who believes that this disease may, under certain favorable circumstances, assume the most malignant form, estimates the time when it will prove fatal at from one to three years. When the disease is permitted to run its natural course, it destroys life in several ways. The size of the tumor may interfere with mastication and deglutition, and the patient dies of inanition; the tumor may encroach upon the larynx and interfere with respiration, and death results from asphyxia; the tumor may ulcerate, and repeated hemorrhages may result in death from exhaustion; the ulceration may become extensive, the source of septic infection from the products of putrefaction, and life is terminated by septicæmia or pyo-septicæmia; or, in exceptional cases, if the disease is not eradicated by a thorough removal, it may assume a malignant type and prove fatal by secondary deposits in the course of the blood-vessels.

Treatment.—The ancients understood well the recurrent nature of epulis, and consequently resorted to effective measures to accomplish its early and thorough destruction. Ætius recommended the application of alum, verdigris, etc., and, if these failed to produce the desired result, he advised extirpation with the knife. Haly Abbas and Celsus recommended excision; Albucasis directed that the tumor be cut out with forceps and scalpel, and then to apply styptic powders to the part, and, in case the tumor reappeared, to resort to the actual cautery; Paulus Æginatus came to the conclusion that no permanent cure could be effected without the employment of the ferrum candens. All recent authorities agree that a thorough removal of the diseased tissues affords the only security against recidivation. Mr. Stanley says,† “In the treatment there is but one consideration involved,—the necessity of thoroughly removing the diseased parts with the tissues to which they have acquired attachment; and, of course, this can be done far more satisfactorily when the disease is of small extent, and limited to its original seat. Therefore, it is important that the disease be recognized before it has crept, as it is apt to do, irregularly and indefinitely into the surrounding tissues.”

The object of treatment—the removal of the growth—may be reached in different ways: 1, by excision; 2, caustics; 3, actual cautery. To insure success it is almost always necessary to remove that part of the alveolar process from which the growth springs; hence, excision has the first claim in selecting our method of operation. It may be followed with profit by the actual cautery for the double purpose of arresting hemorrhage and destroying any particles of morbid tissue that may have evaded the cutting instruments. Caustics are

* System of Surgery, vol. ii. p. 432.

† Opus cit.

not sufficiently reliable to successfully cope with such an insidious and obstinate disease. Only a few authorities recommend their use in mild cases.

Prof. Gross,* in speaking of the treatment of epulis, with special reference to its occurrence in the lower jaw, insists that the incision should extend not only through the sound tissue, but, to make sure of complete removal, recommends excision of the entire thickness of the bone: "I am satisfied that it is worse than useless to temporize with such a malady. The only way is to deal it at once an effectual blow by sawing out a piece of the jaw embracing its entire thickness, and reaching some distance beyond the limits of the morbid mass. I have never known a case in which any other procedure did the least good. In treating epulis we should not lose sight of the fact that it is an affection, not so much of the gums as of the jaw-bone, and therefore anything short of removal of this, at the site of the disease, is an absurdity." In opposition to the treatment given by this eminent surgeon, Mr. Heath says,† "Under no circumstances, except when the growth is of a malignant character, can it be necessary, I believe, to cut through the whole thickness of the lower jaw, since it has been shown repeatedly that common epulis never involves the base of the bone, and the contour of the face depends so much upon its preservation that it should not be interfered with."

Mr. Salter sustains the views expressed by Mr. Heath when he refers to this part of the treatment, as follows:‡ "It will never, I believe, be necessary to go far below the limits of the alveolar process; for it is with the alveolar bone that the disease is essentially connected. In the lower jaw I would urge the necessity of never cutting through the entire bone, as the breaking of the maxillary arch most seriously interferes with the position of the remaining portions of the bone, and this disturbs the normal apposition of the teeth in the two jaws relatively." This advice should be heeded, and even if the disease be extensive, a narrow bridge of healthy bone is usually found at the base of the lower jaw which should be carefully preserved in order to maintain the proper anatomical relation of the parts. As the disease almost always originates from one of the surfaces of the alveolar bone, the latter must be removed with the growth to prevent with certainty a relapse. The neoplastic deposit is very apt to infiltrate the whole depth of the alveoli, hence the entire length of the alveolar process should be removed. In a few instances, arrest of further development and even complete recovery has been attrib-

* Opus cit., p. 432.

† Opus cit., p. 210.

‡ Holmes's System of Surgery, vol. iv. p. 342.

uted to the physiological atrophy of the alveolar processes following the extraction of teeth.

Such a favorable termination from this measure should, however, not be expected or relied upon. All expectative treatment must give way to a radical operation as soon as a positive diagnosis is made. The tooth of the socket, from which the tumor took its origin, as well as the adjacent tooth on each side, must be sacrificed; after the required number of teeth have been extracted, the soundness of the jaw-bone should be examined to determine the direction of the incision and the amount of bone to be removed. This examination is best made with a small perforator or drill, which is made to penetrate the bone at different points to ascertain its density; the affected portion is soft and porous from the neoplastic infiltration, while the healthy jaw-bone may be known by its ivory-like hardness.

Having ascertained the limits of the disease, two vertical incisions are made on the inner and outer side of the jaw, one on each side of the diseased mass, and at a safe distance from its border; these incisions are carried from the margins of the alveolar process to its base, or further in case the disease has penetrated into the interior of the jaw. These vertical incisions, which should extend to the bone, are connected by a horizontal incision. The incisions in the soft parts mark the line of application for the bone-cutting instruments, and guard against laceration of the periosteum. The vertical sections in the bone are made with a small saw, and the horizontal or connecting cut with a Hey's saw or Liston's cross-cutting bone-forceps. After the tumor has been removed, the cut surfaces of the jaw should be carefully examined, and any suspicious portions of bone removed with a gouge or bur-drill; the surface can be subsequently cauterized with one of the points of Paquelin's thermo-cauterium.

When the tumor involves the body of the lower jaw, and we desire to leave a narrow bridge of bone to preserve the maxillary arch, and upon the preservation of which too much stress cannot be placed, then the use of White's surgical engine offers advantages which cannot be overestimated. Any one who has undertaken to perform this operation with an ordinary Hey's saw must have been fully convinced of its difficulties.

During one of his recent clinics, Prof. J. E. Garretson* called the attention of the class in forcible language to the superiority of the surgical engine over all other instruments in operations involving the maxillary bones, and illustrated his remarks by removing a large sarcoma from the lower jaw, which extended from the lateral incisor to the ramus. After exposing the tumor by an incision through the

* DENTAL COSMOS, July, 1880.

center of the lower lip and along the lower margin of the jaw to its angle, and arresting the hemorrhage, he made a series of punctures with a spear-drill along the track of the proposed cut and completed the section with a small revolving saw, making a rapid and clear section of the bone. This instrument is one of the most useful and practical innovations in surgery, and will soon become as indispensable to the surgeon as it now is to the dentist.

Most of these epuloid tumors can be removed through the mouth without incising the face; but when they have attained a large size, and this step becomes inevitable, then the suggestion and practice of Sir William Fergusson* cannot be too closely imitated, viz., to restrict the incision to the middle lip, which will ordinarily suffice, or, if not, in case the upper jaw is operated upon, to extend it into the nostril of the affected side; by using retractors sufficient room will be gained to render any incision at the angle of the mouth superfluous. By adopting this or similar methods, unnecessary and unseemly scars are prevented.

Should the location of the tumor require a still more extensive incision for its removal, then a semilunar incision is made through the face with the concavity downwards, as practiced by Von Langenbeck; it is carried from the ala of the nose to the orifice of the ductus Stenonianus, and from here upwards and outwards towards the malar bone. Through this incision any part of the alveolar processes can be reached, while at the same time the cicatrix following the operation does not disfigure the face to the extent it would have done had the incision been carried from the angle of the mouth.

If the disease has penetrated through the alveoli into the antrum, it will become necessary to resect the greater part or the whole of the superior maxillary bone. To expose the lower jaw, the incision is made through the center of the lower lip, and along the lower margin of the bone to its angle.

By a very simple procedure Garretson secures the location of the cicatrix below the jaw so as to hide it from view. He marks the line of incision with a pencil, below the jaw, on the side of the neck; then, by flexing the head towards that side, brings the line over the jaw, when the incision is made down to the bone, which affords protection to the deeply located important organs of the neck.

All important vessels are ligated as soon as divided. The wound should be united with carbolized silk sutures, embracing the whole thickness of the lips and cheek, and tightened after all hemorrhage has ceased. Wounds of the face unite in a very short time, and it is important to remove the sutures as soon as union has taken place,

* Lectures on Progress of Surgery, p. 239.

which often is complete on the third day. To prevent separation of the recently united tissues, it is advisable to support the external parts by strips of adhesive plaster, smoothly and well applied. The action of adhesive plaster is enhanced by applying collodium along its edges.

After all operations within the cavity of the mouth it is important to prevent fœtor and to guard against septicæmia from decomposed products of the wound, by the frequent use of antiseptic gargles, of which a solution of boracic acid and biborate of soda is one of the most pleasant and efficient. After the parts have well healed, the requisite number of teeth are inserted on a plate carefully made to fill the gap, and thus restore the symmetry of the mouth and the functions of mastication and speech.

From this imperfect sketch it will be seen that, for the purpose of recognition and successful management of this affection, the dentist and surgeon must go hand in hand. In the majority of cases the dentist is first consulted, and he should therefore possess the requisite amount of diagnostic knowledge to apprehend its nature, and then undertake or recommend the necessary operative treatment.

After the removal of the tumor the services of the dentist are again required with a view to efface the mutilation inflicted by the surgeon in his attempt to eradicate a disease which slowly but surely destroys the life of the patient, unless stayed by the intervention of the art of surgery.

CONTINUOUS GUM ON RUBBER PLATES.

BY J. S. CAMPBELL, PLAINFIELD, N. J.

ONE of the great objections to the use of rubber for artificial dentures is the impossibility of producing with it any resemblance in color to the natural gum, necessitating the use of sectional or block teeth. In many cases, to obtain the desired effect, each tooth should be available for placing in position at the will of the operator, instead of being held arbitrarily in association with others, as in a block. By using plain teeth with rubber for the base and celluloid for the gum, a really natural effect can be produced, the combination, when artistically done, forming an exquisite piece of work, and which is easily the nearest approach to porcelain continuous gum that has ever been attained with plastic materials. This plan does away entirely with bad joints and broken blocks, so often a source of serious annoyance, and gives a plate upon which a tooth may be replaced without vulcanization,—an operation which can be repeated any number of times without injury to the original plate, and which after the

repair is equal in strength and appearance to what it was originally. The method is also applicable to gold plates and to those made of a cast alloy.

Using teeth made expressly for continuous gum or celluloid work, set them up in wax in the usual manner, leaving the front or outside of the roots exposed. Cut a thin strip of the wax, warm it, and attach it to the upper edge of the portion of the wax plate representing the gum, forming a rim which extends all around the outer margin. Finish the palatine surface to the form desired, invest in the flask in the usual manner, remove the wax, pack with rubber, and vulcanize. When removed from the flask the plate will present the appearance shown in Fig. 1, the front or outside of the roots being exposed and the narrow *undercut* rim extending all around, leaving a space with retaining-grooves between the teeth, for forming a gum of celluloid; looking very much as though the substance of the plate had been gouged out for the purpose. The vulcanite plate is now completed, with the teeth firmly attached to it.

To put on the gum, fill up the groove with paraffine and wax (I use this compound because, not being sticky, it does not adhere to the instrument, and it is therefore more easily carved to the form desired) until all the space inside the rim, including the retaining grooves between the necks of the teeth, is occupied. After the wax has hardened, which may be hastened by placing in cold water, carve it into the desired form of gum. The wax may be made very smooth by throwing upon it the flame of a spirit-lamp with the aid of a blow-pipe, taking care not to destroy the outline of the carved gum. Cover the wax with heavy tin foil, burnishing it lightly but smoothly to the wax.

Invest the piece again in the following manner: Place the plate in one section of the flask with the teeth upward, and raised at the front at a greater or less angle, as may be necessary, so that when the investment is completed the upper part of the flask may be removed without dragging. Imbed in plaster to the rim, and pour plaster over the palatine surface, covering the crowns, taking care to fill the interstices between the necks of the teeth, but leaving their outer surfaces exposed. After the investment sets, pour more plaster around the inner edge of the flask ring, forming a ridge, leaving a groove or space between it and the plate. (See Fig. 2.) Complete the investment, and remove the wax from the groove and interstices between the roots of the teeth by pouring boiling water over it. Having selected a celluloid blank of proper size, saw off the outer rim (see Fig. 3); warm this rim of celluloid in boiling water, and with the hand and a cloth press it closely about the teeth, and hold it to its place until stiff; it will then remain there until the two parts of



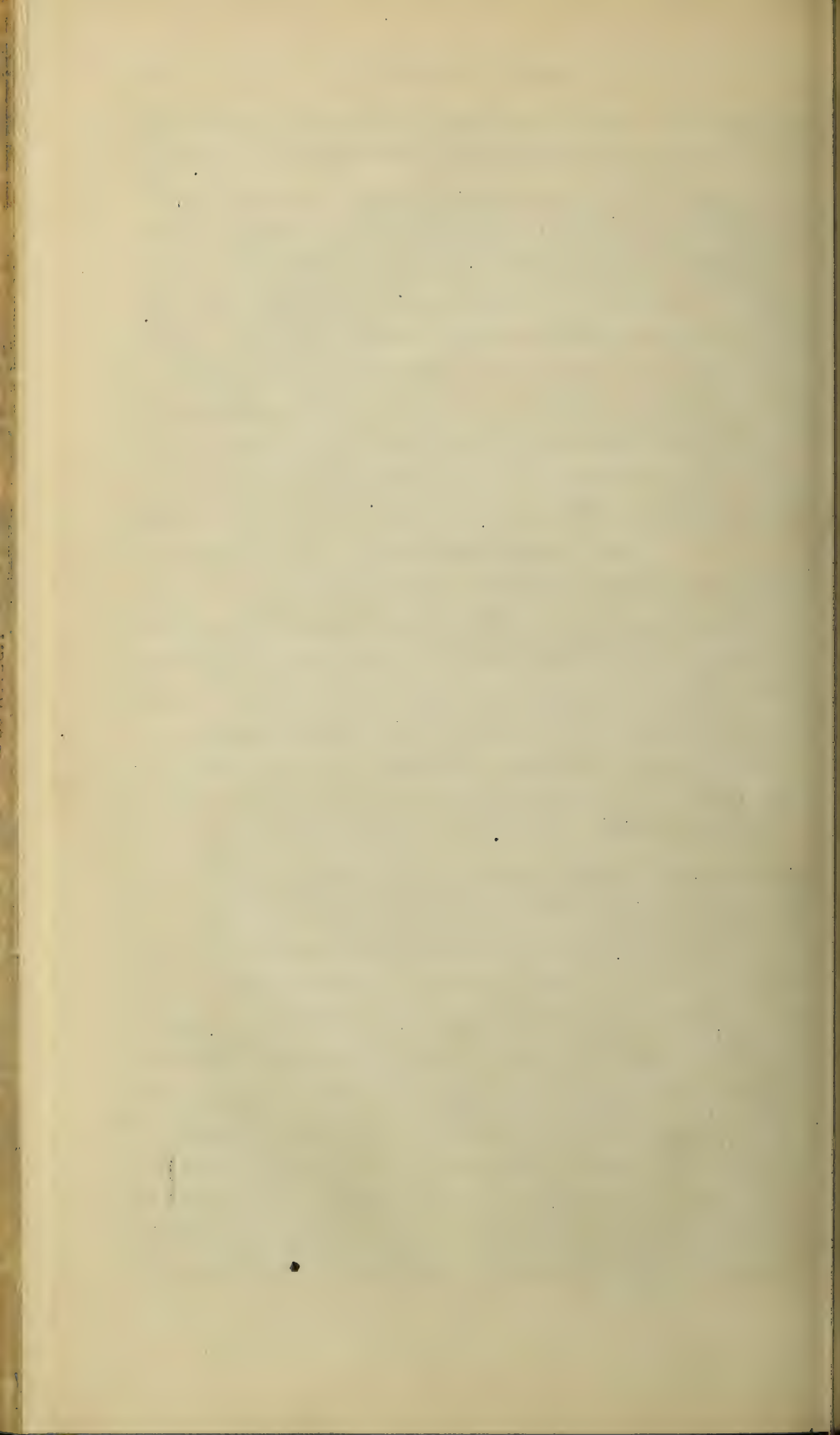




Fig. 3.



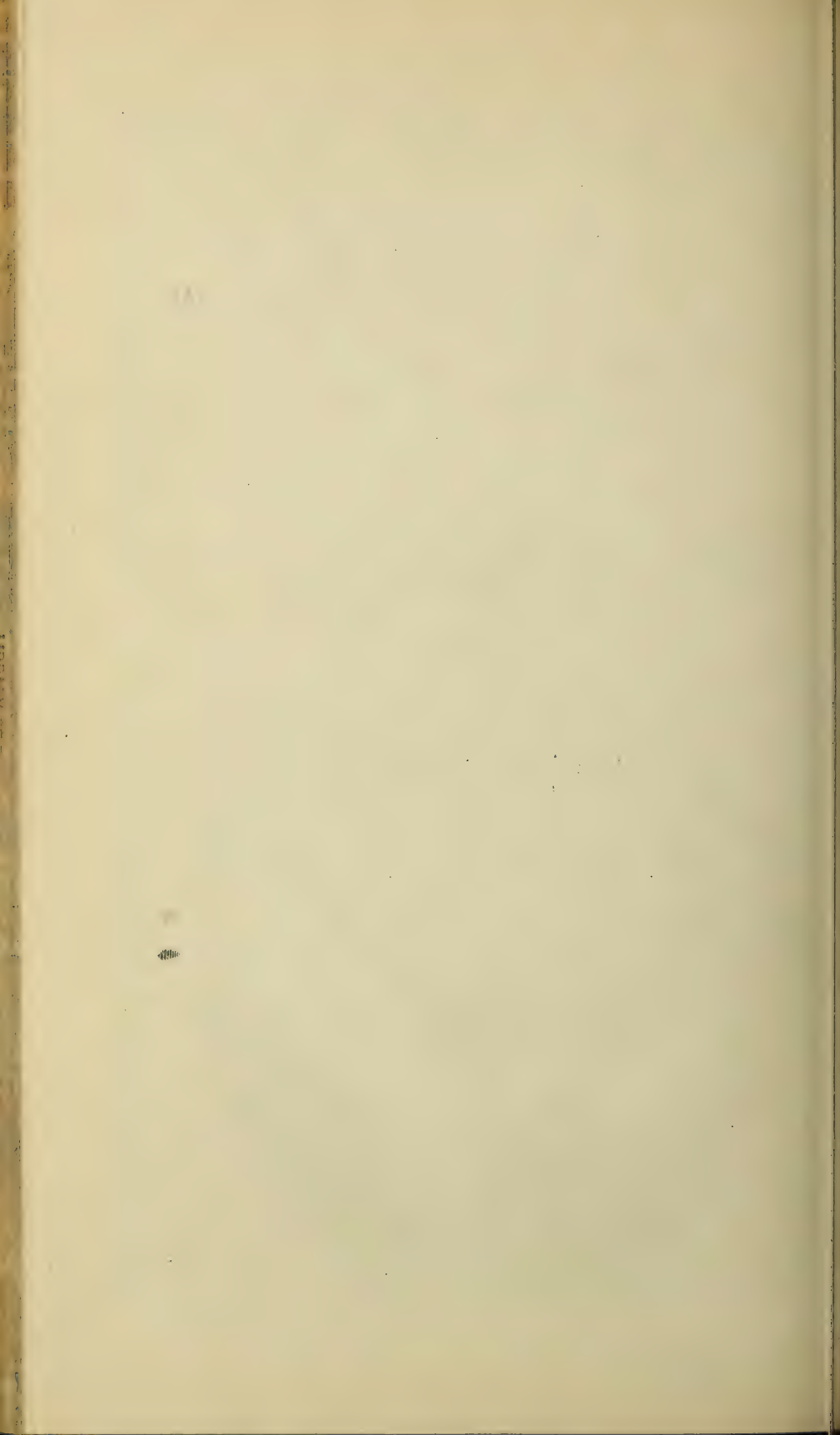
Fig. 1.



Fig. 4.



Fig. 2.



the flask are entered upon the guide-pins. Join the two parts of the flask together and place the investment in the oven of the machine, having previously heated up the chamber. (I am describing the process as used in the "New Mode" apparatus.) When the temperature of 280° is reached the flask may be closed. As soon as this is accomplished the case is ready to be removed from the oven, and placed in a clamp to cool.

When perfectly cold remove the plate. The tin foil will adhere to it, but it can be readily removed by inserting the point of a knife under the edge and pulling it off, leaving the surface of the celluloid gum as smooth and polished as that of the foil. A surface produced by the above method presents a smooth, polished gum, but a much more natural, life-like gum will result if the tin foil, after being burnished to the wax, is "stippled." This may be done by dotting carefully over its surface with a dull-pointed instrument, held nearly vertical to the surface operated on. The strokes should be gentle, not hard enough to *perforate* the foil. This stippling gives to the gum a striking resemblance to the natural membrane, the finished plate presenting the appearance shown in Fig. 4. The adjoining edges of the celluloid and rubber will be found perfectly united, each preserving its sharp outline.

The celluloid will need no further finishing than smoothing down the edges. *The extra hardness of the surface will thus remain to preserve its integrity and color. The contact of the foil with the celluloid renders the outer surface, which is always the densest portion of celluloid, much harder.*

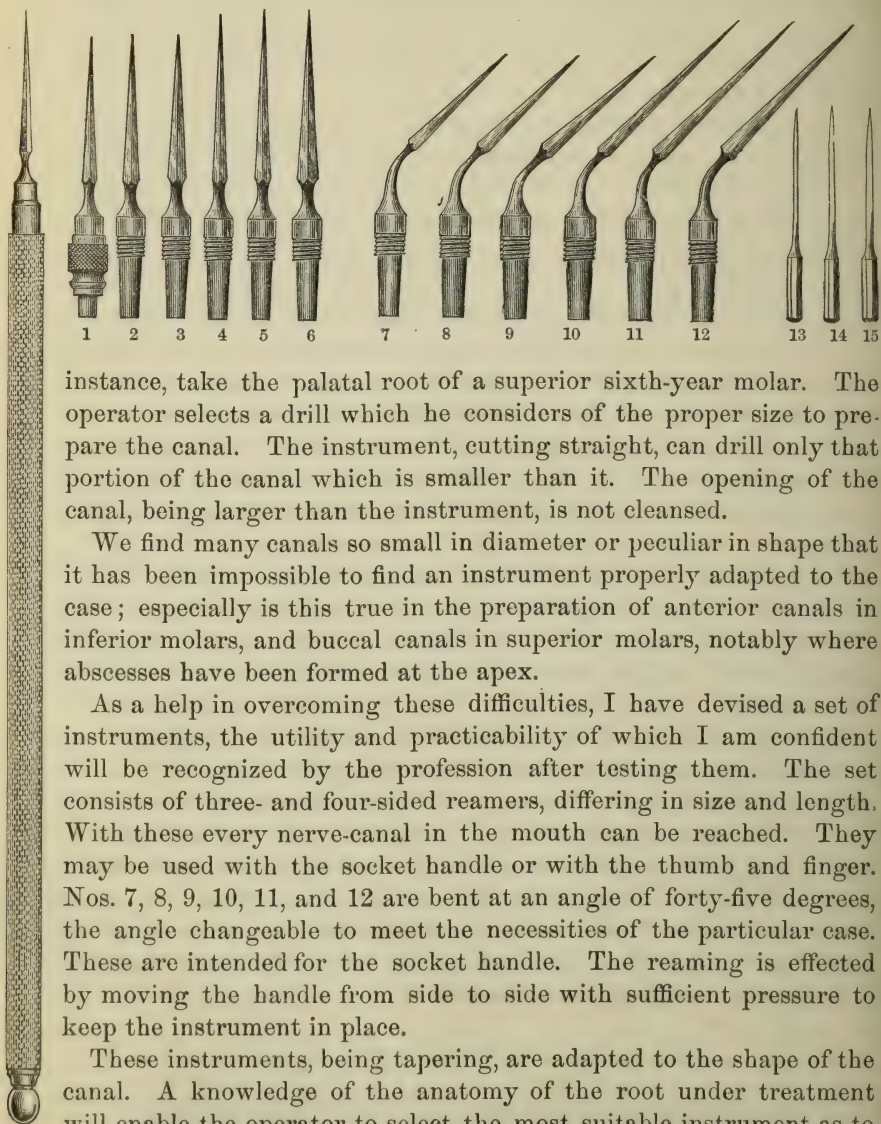
For many reasons celluloid should be treated in such manner that on taking a case out of the flask the least possible labor will be required to finish it ready for use. The care and trouble thus involved will leave a permanent imitation of gum color. Moreover, the operator can display his artistic taste in the earlier stages more easily than after the plate is taken from the flask. *The surface, as it comes out of the flask in the dry-heat process, is believed to be absolutely unchangeable in color, but if this outer surface is removed the permanency of the exposed surface cannot be assured.*

PREPARATION OF NERVE-CANALS FOR TREATMENT AND FILLING.

BY EUGENE S. TALBOT, M.D., D.D.S., CHICAGO.

EVERY one who anticipates success in treating and filling nerve-canals must observe two points: First, the removal of all material liable to decomposition, the formation of gases, and discoloration of

the tooth. Second, to hermetically seal the apical foramen, so that, should gases form, they could not escape into the soft tissues. It is a recognized fact that many canals are but imperfectly cleansed. For



instance, take the palatal root of a superior sixth-year molar. The operator selects a drill which he considers of the proper size to prepare the canal. The instrument, cutting straight, can drill only that portion of the canal which is smaller than it. The opening of the canal, being larger than the instrument, is not cleansed.

We find many canals so small in diameter or peculiar in shape that it has been impossible to find an instrument properly adapted to the case; especially is this true in the preparation of anterior canals in inferior molars, and buccal canals in superior molars, notably where abscesses have been formed at the apex.

As a help in overcoming these difficulties, I have devised a set of instruments, the utility and practicability of which I am confident will be recognized by the profession after testing them. The set consists of three- and four-sided reamers, differing in size and length. With these every nerve-canal in the mouth can be reached. They may be used with the socket handle or with the thumb and finger. Nos. 7, 8, 9, 10, 11, and 12 are bent at an angle of forty-five degrees, the angle changeable to meet the necessities of the particular case. These are intended for the socket handle. The reaming is effected by moving the handle from side to side with sufficient pressure to keep the instrument in place.

These instruments, being tapering, are adapted to the shape of the canal. A knowledge of the anatomy of the root under treatment will enable the operator to select the most suitable instrument as to size and length. Should the canal be curved, a large instrument must first be used as far as possible; then, substituting a smaller one, the curve of the canal can be reached for a greater distance. The smaller one can be inclined to a greater angle and carried farther than the larger instrument.

The advantages of these reamers are that they will reach every nerve-canal in the mouth; will not break from the chips clogging; will not get out of the canal, but will follow and straighten it. Having the shape of the canal, they readily cleanse it, and leave it in a shape more accessible and convenient for treatment and filling than any other instrument. They will not pass through the side of the root into the soft tissues above the apex, because the points do not cut, making them safe instruments in this respect. When the instrument is removed the canal is open to the apex.

"FOOD FOR THOUGHT."

BY J. FOSTER FLAGG, D.D.S., PHILADELPHIA, PA.

(Read before the California State Association, June, 1880.)

GENTLEMEN,—Your corresponding secretary has kindly intimated that another paper from me would be acceptable.

I wrote to you before of the "True Inwardness" of that great movement with which I am so closely identified. I received scores of letters in answer to that paper. I have every reason to know that it made many thinking men think seriously and favorably of our views.

At this time I would speak to you of some things that have afforded me much "Food for Thought," that have steered me clear of many rocks and shoals in the Dental River, and have enabled me to bestow an amount of comfort upon suffering fellow-creatures such as, I am led to believe, has fallen to the lot of but few in our profession.

It is true that we dentists are recognized as givers of relief; but are we not *dreaded*, even in the giving? It is true that we are sought by sufferers; but is it not with *fear* and *trembling*? It is true that "after it is over," the patients are "happy;" but do they rejoice *much* in "the doing"?

Now, gentlemen, this is all *as it should not be*, and it is all due to the *present underlying principles of practice*.

It was an early recognition of this which enlisted me in that work which culminated as the "New Departure." It was the strength of my convictions which enabled me to add what power I did to the solid work of Palmer and Chase. It was the sadness with which I saw the growing demand for porcelain teeth as substitutes for those which skill, time, and money—what a potent combination!—had not the power to save, which drew my heart into the work.

And now that the "first shock of battle" is over,—now that all dentistry throughout the world recognizes that which "Topeka Thompson" so quickly saw,—that "revolution" is the word!—that

the struggle has been long and carefully prepared for,—that we have not only a *theory* which the most eminent scientists of our country pronounce reasonable and consistent, but that we have a *practice* which, when it is seen, is marveled at, and when it is questioned, elicits answers that are confounding,—let us talk of it.

When the truth is told of it, the only reply that has been made is that “the story is a lie!” What manner of men must they be who would descend so low as to *think* a thought like this? What manner of men must they be who would *speak* a thought like this? They put themselves *upon the record* as professional frauds,—as those who doubt, but do not investigate; as those who assert, but do not know; and every one who investigates pities the doubters, and every one who knows smiles contemptuously at the foolish assertions; and when it was called the “*New Departure*,” the cry went up from presidential mouths and annual addresses—*all on the record!*—that there was “*nothing new*.”

How strange it was that three gentlemen who had for varying periods, ranging from thirty to nearly forty years, given their lives to dentistry, who had been for more than a quarter of a century in attendance at societies and associations, who had been frequent and acceptable contributors to dental literature, who had been occupants of lecture-stands, who had been recognized as “workers,” should not have known that there was “nothing new!” Let us talk also of this.

For more than fifty years the hopes of American dentistry have been based *entirely* upon manipulative skill: at every meeting this quality has been lauded to the highest height. Those who were *eminently skillful* were accorded station: if *eminently skillful* as “mechanical dentists,” the halo of the word “artistic” was thrown about them; but *they* were obliged to take the *lower* “high seats,” and look complacent. If, however, they were *eminently skillful* in *working gold for filling teeth*, their *status* was unquestionable; *they took the highest seats and smiled serenely*,—and then they spoke. They told of No. 4 and of No. 6, of No. 40 and of No. 60; they told of velvet cushions and of skins of kid, of watch-spring folders and of broaches; they told of ribbons, ropes, pellets, and cylinders; they told of pluggers of one point, of pluggers of two points, of pluggers of eight points; they even told of pluggers of twelve points! They spoke of having these “serrated deeply,” and they spoke of having them with serrations that were “shallow;” they spoke of having them turned “to the right” and turned “to the left;” they spoke strongly and bravely for those which were straight and with which “direct impact” could be attained, and they spoke less strongly and more apologetically for those which were crooked and with which only lamentably indi-

rect impact could be accomplished; they spoke of "soft gold" and "cohesive," of "sponge gold," and of "crystal," of "retaining pits," of "beveled edges," of "Mack's screws," of "rubber dams," of "clamps" to clasp the necks of teeth, or roots of teeth *far down below the gum!* They spoke of "separating files" so thin that they were marked "nothing," and others still that were so exquisite in tenuity that they were marked "double nothing!" They spoke of care in excavating, care in preparation, care in finish of edges, care in the insertion of gold, care in consolidating, care in filing, care in stoning, care in final burnishing, care in everything, *except for the feelings of the patients!* It was *necessary*, so they said, that the patients *should suffer*, if *thorough* operations were to be performed. And they believed it, and the patients believed it, and *the patients* regretted that it was so!

And what has been the result of all this? You know just as well as I do. You know that in the hard, strong teeth the fillings last for fifty years,—aye, last for life. You know that in the teeth of structure not so strong they last for twelve, fifteen, or twenty years. You know that in the softer teeth the failures come in just about eight years. You know, also, that these are the results *only* of those who occupy the very "highest seats." But when we come to speak of the softest teeth, of teeth with dentine "soft as spunk," enamel "frail as egg-shell," what shall we say then? A few short fleeting years—two, three, or four—will tell the tale. The tale of "jewels wrecked," of money wasted, of hopes blasted, of *fears realized!* The "vulnerable spots" are so apparent, and the "defective manipulation" (!) is so painfully evident, that the serene smilers of the highest seats have not the heart to smile; but the complacent occupants of the "lower high seats" introduce the artificial substitutes with unaltered complacency. And so, as the result of battling against "law,"—the "law of compatibility,"—and depending upon "manipulative skill" for the saving of teeth, "three millions of porcelain teeth are mounted,"—not merely manufactured, but used,—in the United States alone, *annually!* This, in the *home of American dentistry!*

Dr. S. B. Palmer enunciates, in view of this, that "compatibility of filling material with tooth-bone is the foundation for the successful saving of teeth." Is there nothing *new* in this? *Who ever said so before?*

Again: as the material upon which to expend this "manipulative skill," it has always been taught that "gold is the *best*." The teaching in regard to gutta-percha is, and has been for thirty years, that it is an "excellent material for temporary work." The teaching in regard to amalgam is, *even yet*, that its use is subversive of "first-class dentistry,"—*and so it is; BUT*, in "subversion," I believe that by

the *educated* use of amalgam many millions of teeth which are now lost annually would be comfortably saved. I do not make this statement captiously or incautiously, but as the result of calculations based upon an *amalgam experience of twenty-five years*. During the *past ten years* I have taken no new patients except such as have teeth *below medium* in quality. I operate upon no teeth except such as I regard as requiring "plastic fillings." *I said at Niagara, in 1878*, that I had "*to the full*" this class of teeth. This is the explanation I have always given of the "NO GOLD USED" on my appointment cards. It is understood by those *who wish to understand* that when I speak or write from "New Departure" stand-points, the discussion pertains *exclusively* to teeth "*below medium in structure*."

As I said in New York, as Dr. Palmer has said, and as Prof. Chase has said, the *abandonment of gold is not and never has been* advocated by the "New Departure." We know, just as well as the most radical gold-filler knows, how useful, beautiful, durable, and appropriate gold is as a filling material for accessible cavities in good, strong teeth; but *we also know*, as Prof. Henry S. Chase enunciates, that "in proportion as teeth need *saving*, gold is the *worst* material to use." Is there nothing *new* in this? *Who ever said so before?*

Again: it has always been taught, *and is now taught*, that, in order to secure success as the result of a filling operation, the filling material must be so introduced as to preclude the possibility of "leakage," and that in proportion as fillings are defective in this particular so are they incapable of attaining the desired result.

This teaching we hold to be *fallacious in the extreme*. Recognizing that just in proportion as filling material is *incompatible* with tooth-bone so must "leakage" between it and the cavity-wall facilitate that electro-chemical action which eventuates in tooth disintegration, we yet recognize that an amount of "leakage" *many times greater*, in connection with filling material which is *compatible* with tooth-bone, *might not be practically detrimental*.

Having experimented in many scores of cases by introducing most carefully, and by having introduced under favorable auspices, gold fillings in cavities in soft teeth, and having contrasted their durability with equally well-introduced fillings of gutta-percha (red and white), I found that the comparison was most unfortunate for gold, and most creditable to gutta-percha, as the *average durability* of the plastic filling was from *two to three times that of the gold*. I had also proven, by experiment, that as gutta-percha was introduced in a plastic (heated) condition, and was thereby *expanded*, and as it became hard by cooling and was thereby *contracted*, it was, of necessity, a very "*leaky*" filling. Here, then, we had an eminently tooth-saving and eminently "*leaky*" filling.

I therefore enunciated: "A filling may be the *best* known for the tooth, and yet *leak badly*." Is there nothing *new* in this? *Who ever said so before?*

And these three *new* fundamental assertions are the "tripod of life" to the "New Departure."

They are not its life because they are *new*, but because they are *true*. They are its life because as practice based upon these three propositions spreads, as it is spreading, every day, the "New Departure" lives.

Already the societies teem with discussions of "plastics;" already the "harmony" (?) of some filling materials with tooth-bone is spoken of as "greater" than others; already the eminent occupants of the "high seats" are giving flaming testimonials regarding the "superior excellence" of certain plastic preparations, *of which they know nothing, or they would not give them!*

Already the "straws show plainly toward whither the wind bloweth," and the "CREATURE'S" *paw is upon the helm!**

CLINICAL REPORTS.

PHILADELPHIA DENTAL COLLEGE—HOSPITAL OF ORAL SURGERY.

NOTES ON CLINICAL SERVICE OF PROF. J. E. GARRETSON, M.D.

REPORTED BY WILLIAM C. FOULKS.

CASE I.—Mr. —, epithelioma. You all remember, gentlemen, this patient, for whom I performed an operation at a previous clinic. You see the happy result. I will mention, for the benefit of those who did not see the operation, the mode of procedure. The disease for which it was performed was located at the left angle of the mouth, involving a portion of the skin of the inferior lip. I think that I have made a very happy discovery in relation with this disease,—epithelioma. Starting from the stand-point that no good man can be placed in contact or association with the bad without being influenced to a greater or less degree, and *vice versa*, I dissected up a flap of sound skin from the exterior metacarpal region of the left hand, but leaving

* NOTE.—The following spirited but somewhat peculiarly constructed sentence is taken from "Transactions of the California State Dental Association for 1879," page 268:

"Gentlemen, through the ignoring of these special conditions, as well as our hasty and indifferent manipulations, may it not be attributable the rising of that creature now gaining rapid headway in the East,—'The New Departure'?"

it attached by pedicle; removed the last traces of diseased tissue from the affected part; then placing the hand, with the flap of healthy skin dissected up, in such a position against the face as to enable me to firmly fasten the flap in the place from which I had removed the epithelial sore, I sewed and bound the hand firmly in position. Everything was well; but on the second day, from sympathy for my patient, I was induced to detach the flap from and allow him to remove his hand. As a consequence the epiderm sloughed off, the true skin, however, remaining intact. In spite of this accident, the patient, as you see to-day, appears to be perfectly well. This is the first case in which I have ever lost the epiderm. I usually keep the parts bound together for three days. All epithelioma is not cancer, although pathologists disagree; some—Paget, Velpeau, and Schuk—calling it epithelial cancer; others—Lebert, Hannover, Bennet, and Lawrence—opposing this view. Be that as it may, the disease is plainly attributable to an epithelial or epidermic abnormal cell-action. By the operation practiced in this case I have repeatedly removed it, effecting a perfect cure. But it may return in this case. If it does, I hope you will all remember the loss of the epiderm.*

CASE II.—Caries of the palatine process of the superior maxillary bone. Cause, venereal vice. In the management of this case, gentlemen, I first adopted the expecto-assistant attitude. That is to say, instead of the patient maintaining a low grade of inflammation, I wanted to see him get worse. But he did not. So, because nature would not or could not throw off the incubus, I inferred the surgeon to be indicated. The local treatment of this disease is in itself quite simple. The portions of ulcerous bone, as well as that which has absorbed the virus, are to be fully and freely removed, until a solid and healthy surrounding structure is obtained, which is able, and possibly may be endeavoring, to repair or restore the loss sustained. Some of you may remember how the mouth looked before I operated upon it,—the number of fistulous openings leading to the carious bone, the appearance of the inflamed tissues, etc. I reamed out all of the carious bone to be reached through the openings, with one exception, which I thought might take care of itself, and dismissed the patient. He is back to-day, and the mouth is perfectly well, with the exception of that one opening, which is earnestly expressing its desire for help. I will help it. The old way was to cut out the bone with chisel and mallet, or with chisel alone. But that, you will understand, gives more or less shock to surrounding tissue, which is always to be

* This case is reported in full, with illustrative cut, in the *Philadelphia Medical Times*, September 25.

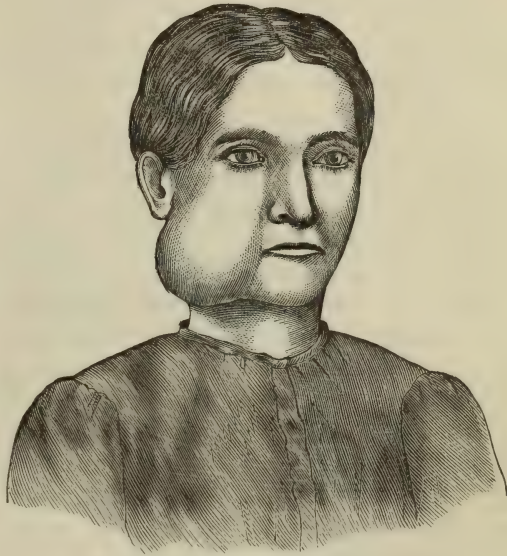
avoided. The best instrument I know of for this work is the dental engine, using a sharp, well-tempered bur, which cuts fast and gives very little pain. I have frequently removed large portions of carious bone, the patients taking no anæsthetic, and flinching very little during the operation. You notice very little flinching in this case. How do I know when to stop cutting? I may answer, How do you know when to stop excavating a carious tooth? Simply by the feeling of healthy dentine,—a touch—the appreciation which comes out of experience. I am just now cutting back to the base of the alveolar process. What artery may be cut? Yes, posterior palatine. But I am not concerned about cutting it, nor would I expect profuse hemorrhage if I did. Why, again? This bur tears the coats of the artery into shreds, which contract, curl up, and interlace, grasping the fibrinous elements of the blood like so many fingers, effectually arresting any hemorrhage. I will continue stimulating local applications, conjoined with other treatment directed to the vice of which this condition is an expression.

CASE III.—I bring to your notice now this important case. I shall ask you to study it particularly in its relations with the profession of dentistry. You will have it in your power, by timely warning or prompt action, oftentimes, to prevent disfigurement for life: even you may prevent death. If you have no desire to perform these operations, you should, at least, know from the pathological expressions when they are indicated, be able to understand and interpret pathological conditions, and, by timely warning and advice, to prevent or mitigate much suffering. Let us now consider this case: I find that the beginning of the trouble is associated in the memory of the patient with bad teeth. Some time since her dentist, recognizing that something was wrong, advised her to seek consultation. She delayed, and to-day you see her having a large tumor on the body and ramus of the right inferior maxillary bone. What kind of a tumor is this? Examining it, out of experience I will name it a cystoma. Yet that term expresses a hundred things. All cysts are cystomæ. Finally, as I cannot explain its nature and origin at present, I shall call it a neoplastic cystoma. As I understand it, the trouble commenced, apparently, near or at the root of the wisdom-tooth, and little by little the growth enlarged and expanded, until now even the position of the sigmoid notch is occupied by it. The anterior boundary of the tumor is the cuspid tooth, the line continuing posteriorly along the external inferior boundary of the bone, following its curve at the angle, and ascending to the sigmoid notch. The superior and external boundary is the cheek, which I shall dissect away in exposing the cyst. I do not enter upon this operation without a full consideration of the possibilities, good and bad, of

necessity associated with it. . . . Professor Dorr will now etherize the patient. The tumor involves externally the facial and submaxillary arteries. Of other complications existing, I have no definite knowledge as yet. Calling it a cystoma, I hope to remove it. . . . The patient is now etherized. The first thing is to uncover the tumor. I insert my knife at the base of the symphysis, cutting forward and upward, and dividing the lip in the mesial line. I save all the blood I can by ligating the arteries as we proceed. In this case the ligating is to be well and quickly done, for the patient is very fragile. The mental and coronary arteries are now tied. You will notice how they were tied,—in such manner, should the ligature break from the strain, as to prevent the ends being torn away, retracting within the surrounding tissue, and complicating the operation. I cut the ligatures off, so as to allow one end to be out. Little things are not to be forgotten; their observance may be the success or failure of an operation. The chances are that I shall cut the facial artery in uncovering the tumor at the notch, as the line of incision will follow the boundary-line continuous from the cuspid tooth, which I mentioned before. I am now cutting backward towards the angle of the jaw. Be careful here to feel for the edge of the bone, that you do not go plump into the arteries of the neck, and so kill the patient and end the operation. I am now cutting down close to the bone, because I want to save tissue. I have cut the facial artery where it runs up and around this cyst. An operation like this is tedious. It is also a matter of life or death. I don't know whether the patient will survive, but hope for the best. We have ligated the facial artery, so I proceed. The diagnostic feature of a sarcoma, or encephaloma, is its vascularity. I do not find that here. I have now dissected the skin from the tumor. I am going to see what this is by cutting right into it. There! you see the fluid contents of the cyst, and that I was right in calling it a cystoma. (In the second cut the skin has been dissected away from the tumor, and turned over and upon its continuity, showing the location, appearance, and extent of the cyst, and its association with the surrounding parts before being punctured by Professor Garretson.). . . . "The patient is sinking. We give some brandy, and proceed to take away the tumor. Always remember to have brandy ready in cases like this." (In the removal of the cyst it was found to involve all the external portion of the bone included in the boundary mentioned before, from the cuspid tooth to the sigmoid notch, and which on removal of the tumor presented the appearance of numerous cystic sulci, necessitating throughout the greatest care and delicacy of manipulation with the knife and other instruments, to avoid crushing through the internal wall or surface of the bone into the mouth.) . . . "I first pronounced it a cystoma; now it has

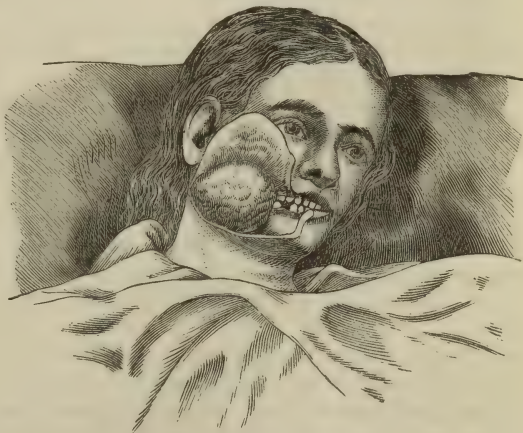
assumed the clinical characteristics of an osteo-enchondroma." (In removing that portion of the tumor, or cyst, associated with the sigmoid notch, it was followed by a rush of blood, which threatened to exsanguine the patient in a few minutes. This was very alarming, evidently giving much concern to Professor Garretson. The immediate question became its control; it was anticipated that the primitive carotid would have to be tied. The patient, being naturally delicate, could not afford to lose much blood. But by vigorous efforts in packing, aided by the use of astringents, it was controlled without resort to so complicated an operation. The packing of the final operation was a ribbon of linen one-half yard long by one inch wide. It was allowed to remain for five days, not being removed until suppuration exhibited freedom from hemorrhagic danger.) . . . "I now wash and replace

FIG. 1.



External appearance of tumor.—From life.

FIG. 2.



Tumor uncovered.—From life.

the parts, transfixing them firmly by means of pins, winding the ligature in figure-of-eight around them, and thus drawing and holding the parts together. Next I apply the bandage, not forgetting to place a compress over my packing. Now, gentlemen, the operation is finished. If the patient survives the shock, I hope for a speedy recovery."

NOTE.—On the ninth day the patient left the hospital cured

PROCEEDINGS OF DENTAL SOCIETIES.

AMERICAN DENTAL ASSOCIATION—TWENTIETH ANNUAL SESSION.

SECOND DAY.—*Morning Session.*

THE association was called to order at ten o'clock, President Shepard in the chair.

Dr. C. S. Stockton read the report of the Committee on Dental Directory (Dr. D. C. McNaughton, chairman).

The report stated that the work was well under way, the following lists being announced as completed: District of Columbia, States of Indiana, Texas, Kansas, Missouri, Nevada, and New Jersey, and the Territories. Louisiana, Virginia, Kentucky, Massachusetts, Vermont, New Hampshire, Rhode Island, Maryland, Maine, South Carolina, Illinois, Wisconsin, New York, and Arkansas were reported as ready, or nearly so. The report urged upon the members of State societies the necessity of having their rules amended, or resolutions introduced, so as to have the lists corrected each year, claiming that the work would be very slight when divided among so many, whereas, if not corrected each year, there will be but little value to the lists in a short space of time.

The report was received and the committee continued.

Dr. H. J. McKellops offered the following resolutions:

WHEREAS, It is desirable that the dental profession, as a body, should give countenance to no other material for filling teeth but the best, and encourage the greatest attainable thoroughness in the treatment of diseased teeth; and

WHEREAS, Of late years many different alloys for the compounding of amalgams have been presented to the profession for their adoption, and put upon the market by the manufacturers, warranted to resist chemical change and thermal influence; and

WHEREAS, Some few members of the profession have seen fit to engage in the manufacture of said alloys for the formation of amalgams, and have used their position as professors to promulgate the doctrine of the superiority of amalgam compounds over all other materials as a filling for the preservation of the teeth; and

WHEREAS, Other members of the profession, holding responsible positions in some of our best colleges, have permitted their names to appear in connection with the said advertisements, setting forth the many fine qualities and rare virtues of these compounds, thereby giving countenance of a scientific character to the sale and use of these compounds; and

WHEREAS, Many members of the profession are but slightly acquainted with the many principles involved in the choice of the best material for filling, and very naturally look up to the professors in their scientific character as authority in all such matters; and

WHEREAS, There is a peculiar impropriety in professors lending their names to the advertisements of these or any other compounds, inasmuch as charlatans

lose no opportunity to exhibit and parade the names of these professors before an ignorant community, in justification of their constant use of an inferior material for filling teeth; now, therefore, be it

Resolved, That this association discountenance in a formal and emphatic manner the pernicious practice of members of the profession, but more especially those holding high positions in our schools, of allowing their names to appear in advertisements as indorsing either any special material or compound for filling teeth, or any therapeutic agent whatsoever.

Dr. W. H. Atkinson thought the resolutions should be explained and digested before voting either way upon them. His feelings were in concord with the spirit of the resolutions. If they were aimed at Chase and Flagg, why not say so? However much we may deprecate the fulsome self-sufficiency of these men, let us not compel ourselves to follow in their footsteps by denouncing wholesale without investigation. Every man who has a soul has been pained by the idiocy in the claims put forth by them. Let us be careful not to think we are at the top of the ladder, but instead, let us remember that we have accomplished very little in the way of demonstration as to what is the best material to resist decay. Who is there competent to take the statistics of treatment and pronounce *ex cathedra* the final judgment?

Dr. E. T. Darby, Philadelphia. The spirit of the resolutions is not to condemn any one material, but the habit of indorsing indiscriminately materials sold by manufacturers. They are not driven at any one specially, but at this habit. It is that which all of us should condemn. Its effect is pernicious in every way. When a manufacturer delivers samples of his goods to a practitioner he expects compensation in some shape, whether it be in the form of an indorsement or money, or however the equivalent comes. Indorsements of this kind fall into the hands of the charlatan, and the material is recommended by him to his patient, "Why, here's the indorsement of Dr. So-and-so." It may thus become the cause of great harm. He hoped the resolution would pass unanimously, and that the day was coming when materials for filling will go upon their merits, without indorsement, however high.

Dr. W. H. Morgan, Nashville, thought the matter purely a question of ethics, and that there was a clause in the Code that covered it. We don't know the first principle that lies at the bottom of these preparations, yet we find them indorsed by those high in authority. He hoped the resolutions would pass.

Dr. W. W. Allport, Chicago, apprehended that many of these recommendations are not given with the idea that they will ever reach the profession. Certainly we have the right to express our opinion, but he could hardly believe that any respectable man would give a recommendation as an equivalent for materials received.

Dr. McKellops sent up to the secretary's desk a dental journal containing the advertisement of a material for filling teeth with the recommendations of seven professors in dental colleges attached.

Dr. W. C. Barrett, Buffalo, asked if the gentlemen knew of any case where the private correspondence of men holding prominent positions had been invaded for the purpose of procuring indorsements. He doesn't think that is the case in all instances, but on one occasion he had been so used himself, and immediately on seeing the indorsement in print (which had been taken from a private letter of his) he wrote to the editor to have it corrected. It seemed to him that this was the only way an honorable man could take to right himself.

Dr. George A. Mills, Brooklyn. How far are we to be restricted in this direction? We owe it to the profession and to the public to say what can be truthfully said in favor of good materials. He maintained that he had a right to say what he had said in the testimonial he had given. He knew it was going into print when he wrote it.

Dr. T. L. Buckingham, Philadelphia. It is a nice point whether we are to be allowed to recommend anything, publicly or privately. This party had called on him for a recommendation, and he had declined to give it because the party refused to give him the formula. Without this how was I to know if it differed from any other composition of the same nature, or that the manufacturer would continue to make it according to that formula? We should not give a recommendation for any preparation of a secret nature. The practice of so doing should be condemned. We can never tell what we are using unless we know the materials of which it is composed. If we were as careful in putting our names to a recommendation as to a promissory note we should make fewer mistakes.

Dr. L. D. Shepard, who had called Dr. Peirce to the chair, offered an amendment, to add to the last resolution the words, "the nature or composition of which they are ignorant of;" the amendment was afterwards withdrawn.

Dr. Buckingham contended that we have a right to recommend what we know to be good. What we want to get at is the condemnation of the practice of giving recommendations to secret preparations.

Dr. Morgan. Regular physicians are not found to recommend in this way any article, no matter if it has been officinal for five hundred years. If a physician knows an article or a preparation to be good, the pages of the medical journals are open to him. The whole matter appears to be in direct violation of the Code of Dental Ethics. It is no matter if the components and method of preparing are generally known, the tendency of the practice of giving testimonials of this character is held to be to lower the dignity of the profession.

The resolutions were adopted. Dr. Atkinson, who voted in the negative, explained that he so voted because he thought the mere publication of the resolutions would be sufficient to accomplish the object in view without the necessity of a vote; because he believed he was a free agent, and was unwilling to fetter the free will of others.

President Shepard resumed the chair, and the consideration of the reports of Section Sixth, Pathology, Therapeutics, and Materia Medica, was resumed.

Dr. Morgan disliked to see the subjects alluded to in the reports passed without further discussion than had been had, especially diseases of the antrum, which are of very grave importance. The cases related by Dr. Morrison were of the simplest forms of the disease, and he nominated them catarrh of the antrum, and followed their treatment no further than that applicable to the simplest form. Occasionally, however, we see the disease developed in a much more serious form, accompanied with pains in the face and along the spinal column, and dizziness; he has known the disease to be mistaken for softening of the brain. In these cases of the more serious phases of the disease, it is sometimes necessary to put the patient under constitutional treatment. It is necessary to do more in the case of a scrofulous patient than to attempt the removal of the local disease; the patient must be built up, as there is likely to be necrosis of the bones. He related the case of an old gentleman with the characteristic symptoms which had come into his hands. The case was cured in ten days by opening into the cavity and applying mild escharotics.

More recently, in the case of a strumous patient, the disease had been diagnosed as softening of the brain after months of general treatment. He was put under vigorous treatment on coming into my hands for six weeks, opening into and cleansing the cavity, which was followed by a cure. Disease of the antrum frequently arises from the state of the teeth. In all cases the first step should be the free opening into the cavity to see what is there, and then the patient should be put on treatment.

Dr. J. G. W. Werner, Boston. Necrosis of the antrum should not be treated by the injection of escharotics. What is needed is a surgical operation; the less injection of escharotics the better. The great thing is to keep the parts warm. Injection is painful, and has a tendency to partially destroy the mucous membrane. A little warm water and salt is grateful to the patient. If you use escharotics you irritate the parts. He related a case of necrosis of the antrum which had recently come under his care. It had been in progress for two years, and when he saw it the patient's systemic tone was lowered from pregnancy. The best results were obtained by cleansing and

keeping the parts warm. He warned the gentlemen against irritation, and to avoid it would simply keep the parts warm by applying flannel saturated with rum or brandy steam; would inject very little.

Dr. Atkinson. We can hardly go astray if we know what irritation is. It is the kindly friend which operates the nutrition of the body. If it is pushed beyond the point of healthy nutrition, inflammation is set up. As you hope for success don't depend on warm applications; use either hot or cold. What constitutes the irritation is a disturbance of the normal function of the parts; you never have abscess of the antrum until you have occlusion of the outlets of the antrum. He has known abscess of the antrum to run ten years, and on opening nothing but glairy fluid escaped, and the mere opening and simple washing of the cavity was sufficient to effect a cure. You can only get necrosis when you have constitutional deterioration of the tissue, but when a case presents you have only one remedy, and that is surgical. Support your patients by giving them good food until nature sets up the line of demarkation, is the doctrine of the schools. You need not keep your mind on the location of the disease, but on the cause of it. Medication is simply supplying the normal food of the body and restoring it from some form of deterioration.

Dr. Werner. Can we never have inflammation without constitutional deterioration?

Dr. Atkinson. No animal in a state of nature ever has inflammation when wounded, nor has a healthy human being. In each the wound heals by first intention.

Dr. Werner claimed that in certain stages warmth is the proper treatment; if you apply cold in these stages you will regret it. Sometimes you can't see the disease. It may be true that it can be aborted by cold, but how are you going to know when irritation begins?

Dr. Mills had a case during the winter which had helped him to understand many things that he did not know before. A lady, about forty years of age, apparently over the average of physical ability, had been treated for Riggs's disease. The course usual in such cases was pursued, but to his surprise he found the patient in a state of considerable unrest. A casual remark concerning uneasiness in the cheek led to his making an inlet to the antrum at the third molar; a probe was passed into the cavity two inches, and on its withdrawal a very unpleasant odor was perceptible. He treated by injecting with the syringe lukewarm salt and water for two days; there was considerable obstruction to the passage of the syringe beyond a certain point. This was followed by injections of aromatic sulphuric acid for two days, followed by mild cleansing. The case progressed

steadily, with the exception of one slight relapse, to a cure in thirteen or fourteen days.

Section Sixth was passed, and Section Fourth, Operative Dentistry, was taken up.

Dr. E. T. Darby read the report. The section had but one paper to present which had been passed by the censors, although it was not written by a member of the association, but by a gentleman belonging to one of the Western State societies. The title of the paper was "Oral Electricity and the New Departure."

Replantation and transplantation are receiving considerable attention; some operators are doing it quite extensively. One gentleman reports sixteen cases of transplanting, all but one or two of which were successful.

In the plastic fillings, the section simply bring before the association for discussion and approval the improvements in the phosphate of zinc preparations. They would also call attention to various improvements in the forms of gold for filling, foremost among which may be mentioned the platinized gold.

Dr. Darby had much pleasure in announcing the fact that at the invitation of the section Dr. Joshua Tucker, of Boston, who was probably the oldest living practitioner of dentistry, would address the association on Operative Dentistry.

Dr. Tucker was received with applause. He stated that he is now stronger than ever in the opinion that the old system of filling teeth with soft gold was the best. At the first introduction of cohesive gold and the mallet he had condemned it, and he has since seen no reason to change his views. You can make a finer surface to your filling with cohesive gold, but that is not what is wanted to preserve the teeth. The moment you strike the gold with the hammer you condense it, which, in his judgment, dams up the ends of the tubes, thus stopping the exudations from within. He had found that decay in teeth which had been filled did not start from the orifice, but back of the gold, and was caused by acrid accumulations. Our object in filling with soft gold in the early days never was to pack the gold solidly against the walls, but to press it laterally to its place, and when pressed never to move it. After the gold is packed equally in the cavity, by condensing on the surface, you can provide against the secretions permeating the walls of the filling. The safety of the filling lies in not damming up the tubuli.

The paper on "Oral Electricity and the New Departure," reported by the section, written by John J. R. Patrick, of Belleville, Illinois, was read by the secretary. Following is an abstract:

The frequent failures in filling teeth with gold were too apt to lead the practitioner to seek for the cause of failure outside of himself,

for no man who honestly does his utmost is willing to suspect his manipulative skill. He at once seeks for redress in a series of speculations, and, as the result, imagination unconsciously takes the place of reason. There are other causes which have been as fruitful of failure as defective manipulation. First, the continual appeals on the part of patients for inexpensive work; for it is frequently the case that a well-dressed man, wearing diamonds and jewelry, will request his dentist to use the cheapest possible material, and a majority of women will spend more money in one year with their milliners than they spend with dentists in ten years, and still feel the tax of the dentist the heavier of the two. Second, the ease to the patient and the operator in the use of plastic materials. Third, the more profitable employment in a monetary point of view to the operator. Fourth, the deep interest shown by the champions and promulgators of this old system revived of saving teeth in putting compounds of their own manufacture upon the market. He proceeded to discuss and criticise Professor J. Foster Flagg's pamphlet on the basal principles of the "New Departure," and the arguments of Drs. Palmer and Chase. Professor Flagg said that teeth are safer in the hands of the majority of practitioners' turned out from our schools with a plastic material for filling than with gold. The essayist thought so much the worse for the schools. If a dentist cannot fill teeth with gold, he ought not to be allowed to practice. He said that, in the selection of filling materials, to secure a good result it was indispensable that the material used should fit the walls of the cavity perfectly, and exclude completely all those external agencies which induce decay; that it should be solid and undivided in all its parts, fitting it to resist all pressure likely to be brought to bear against it, and, finally, that it should resist to the fullest extent chemical action, thermal influence, and attrition. So long as they were confined to the use of metals for filling material, there is no metal, or combination of metals or substances, that has yet been found that can take the place of gold for that purpose. In his conclusions he held that the word battery was not applicable to any arrangement of elements present in the mouth. Drs. Chase and Flagg, he said, were inconsistent with themselves, and their experiments generally worthless. The essayist denied the existence or possibility of electric currents in the mouth, except by having a tin filling opposite a silver filling, each affected by the moisture and acids of the mouth, when a feeble action would take place whenever the surfaces of the fillings were brought together. Dr. Palmer's views were also criticised freely. Silver and mercury were regarded as unsuited for the preservation of teeth on account of their affinity for sulphur, which is found abundantly in the human body. Dr. Patrick believed that no

substance for filling had yet been found equal to gold, and the paper mentioned the important respects in which gold is superior to any other substance for filling teeth. He discussed amalgams, the contraction and expansion of metals, and conduction.

The paper concluded with the following

RÉSUMÉ.

In recapitulating some of the observations recorded in this essay I desire to call attention to the following propositions:

A voltaic battery cannot exist excepting in the manner directed by Professor Volta, the inventor or discoverer. It consists of an equal number of pieces of zinc, silver, and pasteboard; the pasteboard pieces soaked in a solution of chloride of sodium and then with the metals piled in the following manner: zinc, silver, pasteboard, and so on in the same order, the uppermost plate being of silver, and the undermost plate of zinc; these exterior plates, to each of which a wire is attached, form the terminals or poles of the pile; this was the first of those instruments now so well known by the general name "galvanic battery." The word battery is not applicable to any arrangement of elements present in the mouth. An electric battery is a collection of distinct cells, each cell so arranged in its elements as to secure an electric combination; and each combined cell so electrically joined together as to secure an unity of the whole, thus forming a battery. The plans for the construction of batteries for the generation of electricity are various and peculiar, both in regard to the material used and the arrangement. Thus, we have a Smee's, a Grove's, and a Daniell's battery, each bearing the name of the inventor, and when "dentos and gold" shall be proved to form an electrical combination and be proved to be a battery, *it* may also bear the name or names of the inventors.

If vapor rises from mercury at the freezing-point of water in sufficient quantity to whiten gold leaf, an amalgam filling subjected to the heat of the human body (98° F.) must gradually part with its mercury by vaporization; this can be demonstrated by selecting a few old amalgam fillings, and after accurately weighing them submit them to a heat sufficient to evaporate mercury; this being done again weigh, when the mass will be found to weigh as much as it did before heating. As a further test of the divisibility of mercury under the influence of heat, take 100 parts of Fletcher's alloy, add 60 parts by weight of mercury, and allow the mass to harden, then submit it to a sufficient heat to vaporize the mercury; and weigh the residue, and there will be found 100 parts minus the mercury. Fillings of amalgam taken from the mouth after being in use one or two years and subjected to the same influences will yield a little

mercury; enough to whiten gold leaf, but not enough to reduce the mass ten per cent. in weight.

When an individual, either by bad counsel or a false economy, has been subjected to mercurial or amalgam treatment for diseased teeth, we find that fifty parts of the mercury out of the sixty used in forming the amalgam are vaporized by the heat of the body in a few years and taken into the system in small but regular quantities,—the most potent manner of administering mercury for constitutional effect. Should not this be sufficient to induce every conscientious practitioner to discard all amalgams from the list of filling materials, and be the means of inducing others to be less presumptuous in their speculations and more honorable and resolute in their practice?

Dr. Atkinson denounced the paper as verbiage; if the real flour in it had been given, its reading would have occupied about two minutes. He spurned the idea advanced that any single substance, except oxygen, could exert a deleterious effect upon the system. The idea that fifty out of sixty parts of the mercury in an amalgam filling were absorbed into the system to work mischief was absurd; it would have to be combined with something else before it could do any damage. He objected to the time of the association being taken up with the reading of papers which contained so little real information hidden under a mass of words.

Dr. Buckingham contended that there were some scientific facts in the paper which were worthy of discussion. The theory is that there is no chemical change without the evolution of electricity. He believed that electricity does exist in the mouth, but whether it is the cause or the product of the decay is a problem yet to be solved. The more you study a battery, even of the simplest form, the more you see in it that requires investigation in order to make it clear. Not one man in a thousand can explain the workings of even the simplest form of a battery. Electricity and the incompatibility of metals with tooth-substance are difficult matters to discuss, and should be carefully investigated. The subjects treated are such that an attempt to treat them in a rational manner should not be met in the way this paper had been.

Dr. Atkinson. We need to discriminate between the things we fancy and the things we know. He did not find fault with the study of the depths of the science, but he objected to incompetent men undertaking such investigations, and bringing their crudities to this association. He had a right to characterize the paper as he did from his stand-point. He had waited long for gray-headed men to come to the conception that electricity is but a mode of motion. Decay has two phases, the principal one of which is chemical decomposition.

It is merely a retrogression,—a return of the tissues to their embryonic condition. There are only two compounds of mercury which are deleterious to the human body. Mercury itself is inert, and cannot exert an injurious influence unless it is presented in one of these two compounds.

Dr. Buckingham believed there is a vital power which protects the teeth. If you destroy that you destroy their power to resist decay. Dr. Atkinson had not explained the course of decay—how one element goes to one side and another to the other. The two compounds of mercury spoken of are composed, the one of one atom of chlorine and one of mercury, the other of one of chlorine to two of mercury. One is comparatively inert; the other is very poisonous. Chlorine is taken into the system every day, combined with sodium, in the form of common salt, without injury; but in other combinations it may be very poisonous. Take two of the most powerful poisons we have,—strychnia and morphia,—the four elements, oxygen, hydrogen, carbon, and nitrogen, of which they are composed, are taken into the system every day, and are necessary to sustain life, but when they are combined in the proper proportions they act as poisons. How do we explain the action of poisons on the system? How do they act?

Adjourned.

(To be continued.)

In the afternoon, by the courtesy of the dentists and dealers in dental materials of Boston, the members of the association, with their ladies, were driven through the suburbs of the city. Leaving the Hotel Brunswick at three o'clock, the party drove over the Mill-dam out Beacon Street, up Corey Hill to Newton, to Mount Auburn (driving through the country), to Cambridge to see the Washington elm and Harvard University, and back again through Brookline to the city. The excursion was under the charge of a committee consisting of Drs. L. D. Shepard, S. F. Stearns, and C. H. Osgood, and was thoroughly enjoyed by the visitors.

NEW JERSEY STATE DENTAL SOCIETY.

(Continued from page 497.)

THE following is an abstract of a paper read before the New Jersey Dental Society, July 22, 1880, by Dr. C. S. Stockton, of Newark:

The practice of dentistry is, like marriage, not to be entered into unadvisedly, but reverently, discreetly. There is criminality attaching to incompetency. The higher we go up in the scale of professional practice the more solemn becomes our duty to be capable. All duty, indeed, ought to be performed conscientiously; yet, if the iron-

puddler spoil his mold, it is no great loss; if the barber mangle your hair, it will repair itself; but if the physician, through culpable stupidity, slays while pretending to save, it becomes a crime. And so it is with the dentist who inflicts useless suffering, or mars his patient, or leaves a memorial to curse him in snags and roots of bitterness. The young minister's attention is repeatedly directed to the gravity of his work by the question whether he is "called" to it, and there is a sense in which all of us should so consider our vocation.

Our aim should be to discover the best methods of doing quickly and painlessly what has been such a slow torture,—the invention of schemes which leave no injury and inflict the minimum of pain. Pain exhausts the system and constitutes a heavy draft upon the vital powers; therefore the more it can be avoided the greater the amount of health and strength preserved.

It is for us to study our work upon a tooth with as much forethought and carefulness as the diamond-cutter displays in fixing upon and polishing the faces and angles of a Victoria Regia or Great Mogul. We should determine the best methods of combining strength with beauty; and while we study the various arts and methods whereby to cover nerves and still their throbbing, or embalm the decaying organ, or fill its exterior with the precious metals, while we seek medication and the most efficacious processes for arresting dental decay and death, let us learn to reverence our work. The house we live in can be materially reconstructed,—our eyes fitted with spectacles, our ears with trumpets, and our teeth with fillings and crowns which serve the same purposes as the original parts. In our advance, or rather retrogression, to mechanical dentistry, we learn how to replace the wreck which decay and death have made; we prepare the mouth for the substitutes for its late occupants, and place there partial or complete dentures that are almost the counterpart of nature. In many cases, perhaps, art may improve nature, as where there existed some defect or malformation. Some men have such miserable teeth that the poorest artificial ones would serve them better, and the same facts will hold with reference to the brains of others. But it appears, in our practice as elsewhere, that art is but the unfolding of nature, the carrying to an ideal perfection of the hints which lie latent in the original.

We sometimes affect to disparage the pain which proceeds from an inferior part; we do not respect the protest of a tooth-nerve as much as a twinge at the heart-strings; but all pain is referable to the brain, and though it may not be serious, it makes the haughty soul attend. The resources of pain seem largely to predominate over those of pleasure; pain has ten avenues to pleasure's one, and pleasure is evanescent, while pain is lingering. Lives are shortened by the en-

duration of excessive pain, and to-day it is not so much work as *wrack* that breaks down constitutions. It is the wear and tear and exasperation of nerves which kills. The patriarchs lived their hundreds of years because they simply vegetated. A man at thirty now is a condensed Methuselah. Well for Science if she follows out what she has so well begun in later years in the prolongation of human life by the banishment of pain. Already the average duration of life in the race seems on the increase, and the over-sanguine look forward with hope to the recovery of our pristine longevity.

Bad teeth, with the attendant imperfect mastication and consequent dyspepsia, give rise to hopeless views of life and destiny. Hope flags, faith departs, the gods forsake the sky, and kind Providence is replaced by a melancholy and misshapen chance; thought and feeling die, the tides of life ebb to the lowest; the most fatalistic and atheistic views in philosophy are adopted readily; the whole universe seems bound by irrefragable chains of suffering and remorse; the stars shine with a yellowish glare to the gangrened vision, and a settled misanthropy taunts with the unanswerable interrogatory: Is life worth living?

Consider how all this mournful record might have been reversed by a proper attention to our art. While happiness may not be the end of life nor the test of virtue, yet the pursuit of it is noble and engrosses all, and often it may be chased down and captured in a dentist's chair. Here beauty is regained, character brought back, the esteem of the public repurchased, hope restored, the throne of the deity unveiled, the world clothed in beauty, and the silver lining of the cloud turned outward; pessimism is pushed out by a rejoicing optimism which believeth all things, hopeth all things. A tooth-root may thus become a root of all evil, and its extraction may operate like the eradication of original sin.

It comes also within our plans to discuss the questions belonging to dental pathology; the application of special medication to special ailments, whether the difficulty arise from constitutional or from local causes; to consider the proper treatment in each particular instance; for diseases, like individuals, have a personality of their own. It is the invariable mark of the empiric to have a stereotyped prescription for a malady when general appearances are the same. And here we have to notice that grand discovery, anæsthetics. This great boon has given the world a foretaste of that time when "there shall be no more sickness, neither shall there be any more pain."

And we must not pass by the correction of dental irregularities, whereby a mouth that is as overcrowded as a frontier hostelry, with three in a bed and the floor stratified with slumbering humanity, is rendered commodious and presentable.

We should know something of the principles of chemistry, especially in relation to *materia medica*; we should examine with all the ardor of the wise old alchemists, falsely deemed mad, the pharmacopœia of nature; for earth is the nurse of man, and she possesses for every sickness or wound the *vix-medicatrix*. The panacea for every ill sought by the ancient alchemists does not exist in any one potion, but does exist in nature as a whole, and we should have an ever-increasing desire to know the materials of nature and their purposes and properties for the repair of our frames.

We should also know something of physiology, and learn "what a piece of work is man." It is as an animal we will have to view him, yet it is a noble study. Only recently have the sciences of physiology, histology, and embryology been written. Men confused themselves for ages over insolvable problems of will and destiny, and held a knowledge of their corporeal existence in contempt.

We should know something of the process of digestion and the laws of hygiene. These modern times are insisting rightly more and more upon the necessity of properly-cooked food. The laws of diet, cleanliness, and the general preservation of the health must be reiterated strenuously, so that a blockade against disease may be enforced. It is the evil of a high civilization that men sin constantly against their stomachs and think themselves pious, when a little of the healthful barbarism of the savage would be beneficial.

Some knowledge of general anatomy is necessary, notwithstanding the objection that our profession is but a specialty. A too contracted specialism belittles the mind. The man who knows only his own specialty does not know that thoroughly.

Liberal education is valuable for its own sake, for the pleasure it adds to life, and it is an introduction to the society of the cultivated. But the most classical education is of little worth without the foundation of good habits. One may be never so skillful, yet if he is not affable and gentlemanly, cleanly in dress and person, and refined in language, no gentleman or gentlewoman will employ him. Little things determine our success.

Discussion.

Dr. Atkinson. Anæsthesia is death in the ratio of its manifestation. That is the text I would offer as the basis of all intelligent remark upon any paper eulogizing the greatest iniquity that has ever been promulgated in scientific medical literature. I regard the very reverse of the statement made in the paper as the truth respecting it. And, as a rule, science first comes to us wrong end foremost; that is, our first outlook represents to us the obverse of the truth at every step in science, and we are to-day in our sciences most won-

derfully and lamentably crippled by reason of these imperfect presentments of scientific application through the whole system of medical and scientific literature.

Exaltation of feeling is, in certain manifestations, regarded as desirable, and those persons who are accustomed to live under more or less of it of some sort are never satisfied without they are literally drunk. Now we have the reverse of that in carrying it beyond the bounds of endurance; when it becomes destructive we call it pain, and to get rid of that we will do anything. And the folly that I have observed long, and seriously, and sadly, is the assumption of knowledge, on the part of everybody in the sick-room where a patient is in distress, to be able to suggest something that will cure him instantaneously. We want to get beyond that; we want to understand the organization sufficiently to comprehend what function is before we assume to distinguish between normal and abnormal function, between healthy and diseased manifestation. That a person should, except in extreme cases, resort to an anæsthetic seems the offshoot of the barest, blindest ignorance.

There is a want of discrimination between what we know and what we fancy is true. We want a canon of criticism applied to our mental processes whereby we may test the value of what we think ourselves. You should study the timber you work on. As the chemist studies the elements he finds in various combinations, so the surgeon should study the tissues with which he has to deal. It is the demand to have disagreeable things done in a state of obliviousness, so that the pain shall not be felt, that has laid the foundation for all that flashy talk about the beneficence of anæsthetics. It is the too free use of those anæsthetics that is destroying the gray matter of the brain in this generation. Who ever witnessed an operation under the influence of an anæsthetic that was decently done? Who can make an operation that is worthy to be called an operation at all without the coincidence of his patient? It might be excusable, if an operation were to be performed upon an infant or an idiot, to put it into an unconscious state, because it cannot coincide with you in any case. I say to my patients, "You and I are doing this work, and if you will coincide with me we will get good results." I believe that ninety-nine per cent. of the pain in surgical operations is imaginative, is the product of false teaching and the imagination. It is necessary first to gain the confidence of the patient in order to make the operation with the best results. Many of my brethren stand by and see an operation made without the use of an anæsthetic and shudder at its supposed severity, and when I am through with the operation the patient looks up with a smile and says, "Is that all?" And I will show you ten, twenty, one hundred cases of that

kind right along consecutively. If you cannot gain the confidence of your patient by your honesty and intelligence, and the magnetic influence of your personality and human affection, for God's sake don't resort to an anæsthetic to subdue the patient for you.

The following is an abstract of a paper on "Dental Hygiene," read by Dr. C. S. W. Baldwin:

I believe it is our duty to instruct our patients how to care for and preserve their teeth as much as it is our business to remedy the troubles occasioned by decay. The problem is: How shall we educate our patients into a better knowledge of how to preserve their teeth?

George Beard has this for a motto in his work on neurasthenia: "The hygiene of nervous disease has three gospels,—rest, work, and change of work." The health of each member depends upon the health of the whole body, and work is essential to the health of each. If the blacksmith swings his heavy sledge often, the muscles of the arm respond and enable him to swing it oftener. Most persons do not give their jaws exercise enough,—do not masticate their food properly. Neither the teeth nor the jaws have their proper functional activity, consequently there is defective innervation and nutrition of the parts. Not one-half the people who come to my office use both sides of the mouth in mastication. Dr. Watt, of Ohio, says, "The periosteum is more apt to die from lack of exercise than anything else." If our forefathers and the savage had better teeth than ourselves, it was because they used them more; they had coarser food to masticate, consequently had to exercise their temporal and masseter muscles more, which was necessarily accompanied by an increased flow of blood, and with it a deposit of more and better tooth material. When the infant bites on the rubber ring it causes a slight contraction about the crypt of the outcoming tooth, and an absorption of the alveolar process immediately over it; and, better than that, produces slight inflammation, which induces the blood to hasten to its aid, bringing with it material which, in a healthy system, builds up sound teeth.

Dr. Thomas, of Detroit, believes that the only way to induce people to care for their teeth is by a system of education from their childhood. Give the child an account-book in which the parent is to be charged one cent each day that the child brushes its teeth three times thoroughly, and the child is to be charged a penny for every failure to do so. In the end this will be a paying investment to the parent.

In cases of white, chalky teeth, where fillings will hold but a short time, no matter how skillfully they may be inserted, I have prescribed preparations of lime with marked improvement. The removal of

hypersensitiveness to thermal changes is perhaps the first sign of improvement; and if this treatment is persisted in, as any constitutional treatment must be, it will produce great and lasting benefits.

In order that teeth may resist caries they must be hard, either by nature or else made so. The thorough use of the tooth-brush by children will prevent the deposit of that disgusting green tartar the result of which is seen in gold fillings on the labial surface of the superior incisors. They should be instructed in this as well as in the proper use of the jaws in mastication.

It is a good plan to test the saliva of patients, and if found to be acid to use a mild alkaline solution, such as carbonate of soda or borax, to correct the acidity. I accomplish this by the use of borax in tooth powder. This is also one of the best agents for the prevention of deposits of tartar.

Dr. Hayhurst. How often do we find patients having one side of the mouth very tender, the teeth seeming to be a little longer than the others and sore; and you find a deposit of tartar there. You tell the patient that the reason why the mouth is in that condition is because he does not use that side of it. Patients do not know that the exercise of an organ is necessary to its development and health, that the soundness of the teeth and the firmness of their attachment is largely due to their active use. You must have an intelligent knowledge outside of the profession, and a harmony of action between the patient and the dental operator, before the millennium will come.

FOURTH DISTRICT DENTAL SOCIETY OF NEW YORK.

THE annual meeting of the Fourth District Dental Society of the State of New York was held in Johnstown, August 17, 1880. The president, Dr. W. H. Colgrove, in the chair.

The following officers were elected and committees appointed for the ensuing year:

President.—W. H. Colgrove, Johnstown.

Vice-President.—J. H. Collins, Granville.

Secretary.—C. F. Rich, Saratoga.

Treasurer.—A. C. Rich, Saratoga.

Delegates to State Society for Four Years.—P. Sloan, Canajoharie; J. H. Collins, Granville.

Delegates to State Society for Three Years.—A. C. Rich, Saratoga; H. G. Barton, Argyle.

Executive Committee.—A. C. Rich, Saratoga; J. P. Niles, Ballston; C. E. Stacks, Fort Edward.

Committee to Revise Constitution.—W. H. Colgrove, Johnstown; C. F. Rich and W. P. Weed, Saratoga.

The meeting adjourned to meet in Saratoga in August, 1881.

SOUTHWESTERN DENTAL SOCIETY.

IN response to an invitation circular sent to the dentists of Southwestern Missouri and Southern Kansas, a meeting was held at the office of Dr. J. M. White, Carthage, Missouri, August 17, 1880, which resulted in the formation of a society under the above name. A constitution and by-laws were adopted, and the following officers elected:

President.—Dr. E. Hovey, Buffalo, Mo.

First Vice-President.—Dr. J. O. Haux, Columbus, Kan.

Second Vice-President.—Dr. J. T. Lindsey, Carthage, Mo.

Secretary.—Dr. G. A. Keyes, Girard, Kan.

Treasurer.—Dr. C. F. Wright, Springfield, Mo.

Executive Committee.—Drs. J. M. White, Carthage, Mo.; L. L. McLeskey, Neosho, Kan.; and G. A. Keyes, Girard, Kan.

Board of Censors.—Drs. E. Hovey, Buffalo, Mo.; C. F. Wright, Springfield, Mo.; and R. I. Pearson, Kansas City, Mo.

After a very interesting session of two days, adjourned to meet at Columbus, Kan., on the second Tuesday in August, 1881.

G. A. KEYES, *Secretary*.

IOWA STATE DENTAL SOCIETY.

THE eighteenth annual meeting of the Iowa State Dental Society was held at Oskaloosa, Iowa, on Tuesday, July 13, 1880. The following officers were elected for the ensuing year:

President.—M. L. Jackson, Oskaloosa.

Vice-President.—A. O. Hunt, McGregor.

Corresponding Secretary.—L. C. Ingersoll, Keokuk.

Recording Secretary and Treasurer.—E. E. Hughes, Newton.

Executive Committee.—W. O. Kulp, Davenport; A. S. Hodge and L. C. Davenport, Maquoketa.

E. E. HUGHES, *Recording Secretary*.

CONNECTICUT VALLEY DENTAL SOCIETY.

THE seventeenth annual meeting of the Connecticut Valley Dental Society will occur October 21 and 22 ensuing, at the Haynes Hotel, Springfield, Mass.; the meeting opening the first day at 10.30 A.M. All dentists are invited to attend.

A. M. ROSS, *Secretary*.

PERSONAL.

DR. JOHN E. GREVERS, late of New York, has been appointed lecturer on Dental Surgery to the Medical University at Amsterdam, Holland. In selecting Dr. Grevers an excellent choice has been made.

DR. ALBERT WARREN, of Madrid, was appointed dentist to the Royal Court of Spain, on January 2, 1880.

BIBLIOGRAPHICAL.

HANDBUCH DER ZAHNERSATZKUNDE. MIT BENUTZUNG DER ZWEITEN AUFLAGE VON RICHARDSON'S MECHANICAL DENTISTRY. Bearbeitet von JUL. PARREIDT, Zahnarzt an der Chirurg. Universitätspoliklinik, Leipzig. Verlag von Arthur Felix, Leipzig, 1880.

This volume of three hundred and twenty-four pages is, in part, original, but principally made up, as its title-page indicates, from Richardson's "Mechanical Dentistry," second edition. The author states in his preface that he had in preparation a work on this subject, when the publisher of Zur Nedden's translation urged him to superintend the issuing of a new edition. As this of Richardson's was issued in 1869, it failed to meet the present needs of the profession in Germany, and was also defective in modes of practice introduced since its publication. The author, therefore, concluded to combine his own work with it and issue it in this form.

The subjects treated are as follows: Chapter I., The Preparation of the Mouth; II., Impressions; III., Models; IV., Artificial Teeth; V., The Mode of attaching Artificial Teeth and the Danger of Swallowing them; VI., Pivot Teeth; VII., Rubber Plates; VIII., Celluloid; IX., Gold Plates; X., Continuous-Gum and Platinum Work; XI., Cheoplasty and Aluminium; XII., Artificial Jaws, Gums, and Obturators.

In Chapter I., on "the preparation of the roots," the author gives some very good reasons why roots should be removed; but subsequently neutralizes this by exceptions, notably in the case of young persons, where it is important to preserve the natural contour of the jaws, or where great absorption, as in the lower jaw, will render the wearing of a plate with comfort almost an impossibility. His exceptions cover too much ground, and, if closely followed, will tend, eventually, to discard all extraction for the insertion of artificial dentures. In this he unfortunately follows the prevailing practice in Germany, a

practice utterly at war with sound mechanical principles and a violation of all hygienic rules. It is a constant source of amazement to those who have had opportunities for observation, that such a condition of practice should be tolerated by the intelligent operators of that country. The author contends that a proper preliminary treatment of healthy roots overcomes all the objections; but how this can be asserted, in the light of experience, is incomprehensible. The practice in this country for the past half-century has been, in most cases, to remove all roots where a plate has to be inserted, and experience fully justifies this course. The idea he entertains that teeth cannot be worn comfortably on the lower jaw, where great absorption has taken place, is a very erroneous one, and is disproved by the immense number of elderly persons who perform the process of mastication with a facility hardly excelled by the natural organs, and that on perfectly flat under jaws. Experience has demonstrated that, with a good impression, mechanical ability, and perseverance, the difficulty of absorption is easily surmounted. If to make a charnel-house of the mouth be the first duty of the dentist, then the general German practice may be regarded as a grand success; but if health, comfort, and ability to masticate be the requisites, then is it a decided failure. It is to be regretted that the author measurably fails to recognize these facts, and thus has lost an opportunity to give a timely blow to the worst possible mode of inserting plates.

The chapters devoted to the different modes of manipulating gold, rubber, platinum, etc., are, for a hand-book, very concisely written, and contain all that is really necessary; but there is nothing novel in them. It would seem an unnecessary waste of ink and paper to devote nearly three pages and a half to the preparation and insertion of spiral springs, a mode of practice long ago relegated to the antiquities on this side of the water. In his remarks on the platinum base, the author gives the preference to Sauer's mode as being the simplest. The chapter on celluloid is one of the original ones added, and is full in its descriptions and thoroughly illustrated. Among the latter are cuts of the injecting apparatus, so called, of both Winderling and Telschow.

In the chapter on obturators he gives full credit to the various writers and investigators on this subject, but regards the process of Süersen as the best, and, naturally, devotes the largest portion to its elucidation. His statement that the process is but little known in America is hardly justified from the extended notice given it in Kingsley's recent work on Oral Deformities, in which he, with most commendable generosity, gives Süersen's mode the preference. After stating that an elastic velum is better in most cases of congenital defect, he makes use of this language: "That of all obturators to

supply deficiencies of the soft palate and induce correct articulation, the one introduced by Süersen contains the truest principles and is best adapted to the purpose." Words could hardly express more than this.

The general appearance of the volume does great credit to both author and publisher, and fully sustains the reputation the latter has held in the publishing world. The illustrations thoroughly explain the text, and are, in the main, excellent specimens of the art. T.

A NEW SCHOOL PHYSIOLOGY. By RICHARD J. DUNGLISON, A.M., M.D. 12mo, 314 pages. Philadelphia: Porter & Coates, 1880.

The name of Dunglison is a familiar one to the medical profession through "Dunglison's Medical Dictionary," the "History of Medicine," the "Practitioner's Reference Book," etc. We think the "New School Physiology" will make the name a favorite one with young people and lay readers, to whom the knowledge that the book imparts is specially addressed. The illustrations, numbering one hundred and seventeen, are well chosen and clearly printed. The text is tersely written and well arranged. In the main the usual general divisions of the subject are followed. At the end of each division are added questions touching every important point in the text which has been passed. We believe with the author that "No more important subject can be taught in the schools than that which instructs the student in the principles of his own formation." This volume is admirably adapted, both in text and illustration, to accomplish that desirable end.

THE STUDENT'S DOSE-BOOK AND ANATOMIST, COMBINED. By C. HENRI LEONARD, A.M., M.D.

This is a 16mo volume of one hundred and sixty pages, giving a large amount of valuable information in a condensed and convenient form,—pharmaceutical preparations, doses, poisons, antidotes, tests, measurements, weights, obstetrical memoranda, anatomical facts, etc.

OBITUARY.

ACTION OF THE DENTAL PROFESSION WITH REFERENCE TO THE DEATH OF DR. SAMUEL S. WHITE.

IOWA STATE DENTAL SOCIETY.

At the annual meeting of the Iowa State Dental Society, held at Oskaloosa, Iowa, July 13, 1880, Drs. W. O. Kulp, J. Hardman, and A. V. Eaton, a committee appointed to draft resolutions relative to the death of Dr. Samuel S. White, reported the following, which were unanimously adopted:

WHEREAS, By the dispensation of Providence our much-esteemed friend and benefactor, Dr. Samuel S. White, has been called to his long home; therefore,

Resolved, That we as individual members of the Iowa State Dental Society recognize in the death of Samuel S. White, of Philadelphia, the loss of one of our greatest allies in the elevation of our profession. He was pre-eminently the dental profession's friend; ever ready to develop and put before the profession any new suggestion or invention of merit; ever ready to defend the profession against its enemies, both with purse and influence.

For all these favors and benefactions we shall ever hold his memory with a peculiar sacredness.

Resolved, That a copy of these resolutions be transmitted to the family of the deceased; that a copy be preserved in the record of our society and published in the DENTAL COSMOS.

E. E. HUGHES, *Secretary*.

ALEXANDER C. CASTLE, M.D.

DIED, at New York, August 31, 1880, Dr. A. C. CASTLE, in the seventieth year of his age.

DR. CASTLE was born in England, in 1810. He graduated in medicine at the College of Physicians and Surgeons of New York. He had been practicing dentistry for fifty years. Dr. Castle possessed more than ordinary ability; was an earnest writer and debater; genial and courteous in manner; of extreme good humor, and was held in high esteem by a large circle of friends. The testimony of one of his friends—a volume in itself—is that “he was universally liked.”

DR. J. C. STEPHENS.

DIED, September 6, 1880, of typhoid fever, at the residence of Captain C. C. Spears, Rogersville, Tennessee, Dr. J. C. STEPHENS.

DR. STEPHENS was born in Wythe County, Virginia, August 4, 1856. He began the study of dentistry at the age of nineteen, attending lectures at the Baltimore College of Dental Surgery; located in Rogersville in 1876. He was a member of the East Tennessee Dental Association. As a dentist he was competent, and was much esteemed as an honorable man and a good citizen.

SIEGMUND PAPPENHEIM.

DIED, at Berlin, Prussia, August 29, 1880, of inflammatory fever, Mr. SIEGMUND PAPPENHEIM, in the fifty-ninth year of his age.

MR. PAPPENHEIM was the founder and head of the firm bearing his name, the most extensive dealers in dental goods in Germany. He was an honorable man, energetic and successful in business, possessed the confidence of the profession, and was highly esteemed among a large circle of friends.

PERISCOPE.

EXPULSIVE GINGIVITIS.—Dr. Magitot read, at a recent meeting of the Société de Chirurgie (*Gaz. des Hôp.*, June 26), a report by himself and Drs. Desprès and Delens upon a paper upon the "Pathogeny and Treatment of Expulsive Gingivitis," sent in by Dr. Aguilhon. The affection, he observed, has long been known to surgeons under different names, such as alveolar catarrh, suppuration of the alveoli, alveolar pyorrhœa. In 1861, Marchal de Calvi, believing that the seat of the disease was the gum itself, and its effect the expulsion of the teeth, termed it "expulsive gingivitis;" and M. Desprès has delivered a lecture upon it under the name of the premature falling of healthy teeth. Dr. Magitot, from the time of his first investigation of the subject in 1865, has been led to conclude that from its commencement to its terminal period the anatomical lesion exclusively affects on the one hand the alveolar periosteum, and on the other the cement, and, therefore, has named it alveolar osteo-periostitis. It would, perhaps, have been more rigorously correct to have called it *cemento-periostitis*. The phenomena in the vicinity, such as gingivitis, abscess, fluxions, etc., are only produced during the course or towards the end of the malady—always being only consecutive. Besides its anatomical conditions, those relating to its etiology and mode of propagation are adverse to its being regarded as an affection of the gums. It is, in fact, the manifestation of a general condition or diathesis, and is observed in diabetes, in albuminuria, and in gout, the especial age of its occurrence being between forty and fifty. It is a wandering affection, affecting different parts of the mouth, and is always characterized by the destruction of the periosteum and cement. In M. Desprès' opinion it is compression of the teeth within too narrow arcades that is the constant cause of this affection; but in that case it ought never to occur when the dental arches are in a regular condition, or when several teeth have been lost anteriorly. But this is not the case, for very often it may be observed without any compression whatever existing. The instances of compression have been observed accurately by M. Desprès, and they are incidentally accompanied by inflammatory phenomena, by gingivitis, periostitis, phlegmon, or severe neuralgic pains, which may lead to the fall of the teeth and to the presence of osteitis and sclerosis in a variable extent. But this is not the osteo-periostitis in question, and should rather be termed osteitis from compression by the alveolar arch. The teeth which are expelled in these cases are sound, which they are not in the disease under notice. In the early periods of the disease Dr. Aguilhon employs chromic acid, and in the later stages resorts to drainage by means of threads.

M. Desprès, in reply to Dr. Magitot, observed that he had the misfortune to be personally acquainted with this disease, it having caused him during the last nineteen years the annual loss of a tooth, and poisoned his existence for a month each year. He had been able only to obtain a little relief by laudanum gargles; so that he has been always on the lookout for a remedy for the affection, and believes that he has found such. Some individuals have round and others pointed chins; and it is only these latter who suffer, the space

not being sufficient to contain the sixteen teeth unless a molar has been lost from caries, when the suffering from this cause ceases. Constant pressure is kept up between the ascending branches of the lower jaw and the molars, and the alveolus is destroyed, necrosis being set up, and afterwards gingivitis. When the necrosis is completed, ulceration takes place in the alveolus, and pus is discharged. The tooth, under these conditions, becomes a sequestrum, which must be eliminated, do what we will to preserve it. "There is, then, in my opinion but one means of preventing this affection, which I should not have hesitated having recourse to, had I known of it, two-and-twenty years ago,—namely, the extraction of from two to four molars." Dr. Magitot observed that he did not dispute the existence of osteitis from compression, as stated by M. Desprès, but considered that these facts should be distinguished from those of which he had spoken in his report—the two affections being perfectly distinct as regards their etiology, their nature, and their course. M. Desprès did not deny the existence of the osteo-periostitis described by M. Magitot. The alveolo-dental pyorrhœa which he himself described is not a disease of old age, but is developed between twenty-five and thirty years of age in individuals having all their teeth, and gives rise to very intense suffering. The alveolo-dental pyorrhœa of the diabetic and cachectic does not pursue the same course, and is not attended by pain.—*Med. Times and Gaz.*

ABSCESS NEAR THE LOWER EYELID OF DENTAL ORIGIN.—Dr. Parinaud draws attention to this occurrence, which he believes is by no means infrequent, although its origin is overlooked. The summary of his paper is as follows: 1. Alterations in the temporary or permanent teeth may induce suppuration of the lower eyelid opposite the orbital border or in the region of the lachrymal sac, where it sometimes simulates lachrymal tumor or fistula. 2. The course pursued by the pus, which originates in an alveolo-dental periostitis, being intra-osseous, is difficult of detection, and is not always in the same direction. 3. A variety of this peri-ocular suppuration is special to children of about five or six years old. The arrangement of the alveoli of the first and second dentitions explains this predisposition, and explains the occurrence of these suppurations, which may become complicated with necrosis of the orbital border. 4. In the adult, besides the cases of lachrymal tumor, properly so called, which may sometimes be attributable to a carious tooth, suppuration at the great angle of the eye may be observed under two conditions. Pus originating in an alveolus may penetrate into the maxillary sinus, induce inflammation there, and give rise consecutively to the formation of a cutaneous fistula at the inner angle of the eye. In another set of cases, probably much more frequent, the lachrymal passages are free, and the sinus is not implicated, and the connection is not visible which unites the abscess or the fistula to the dental alteration. Vascular canals, which open constantly by one or two orifices on the nasal process of the superior maxillary, and which communicate also with the foramina of the alveoli, explain the development of these suppurations. 5. In suppurations of the lower eyelid, in necrosis of the orbital border, and in suppurations or fistulæ at the larger angle of the eye, we should therefore ascertain whether the cause of the acci-

dents observed is not a bad tooth, the extraction of which is the primary indication of treatment.—*Archives Générales and Medical Times and Gazette.*

REFLEX NERVOUS DISORDERS CAUSED BY DISEASED TEETH.—Mr. Mummery then read notes of some cases in which diseases of the teeth had caused reflex disorders of the nervous system. He thought that by publishing the accumulated testimony of observers with regard to this subject, a clearer light might be thrown upon many obscure cases of nervous disease which baffled the skill of able medical practitioners, and that much practical good might thus be effected. A young lady came to him in January, 1878, on account of severe neuralgia of the left side of the face; it had come on after the stopping of an upper molar some months previously. The patient had also become subject to extreme external strabismus of the left eye, the pupil being quite hidden from sight. The tooth was extracted, and when the patient again presented herself, a few days afterwards, both pain and squint had entirely gone. But ten months later the same patient returned in still worse plight; she had again severe facial neuralgia; she had also ptosis of the left eyelid, the pupil was widely dilated, and her hair was perfectly blanched to the extent of fully two inches over the left temple. Mr. Mummery found that the next tooth to that which he had extracted had become carious; he at once removed it, and in three or four days the eye recovered its natural appearance, the pain also ceased, but the patient even now retains the patch of white hair on her left temple. Mr. Mummery related several other remarkable and interesting cases. In some of these apparently sound teeth had been the cause of reflex nervous disturbance—*e. g.*, cases in which the wisdom-teeth have been retarded by want of room, or in which exostoses had formed on the roots of molar teeth.—*Report Odont. Soc. of Great Britain, in Med. Times and Gaz.*

HEMORRHAGIC DIATHESIS.—Dr. Walker related the case of a night watchman, aged thirty-eight, the subject of hemorrhagic diathesis, who had recently been under his care at the Westminster Hospital. When nineteen years of age this patient had an upper molar extracted, and was laid up for a week on account of hemorrhage. The actual cautery was used. Five years ago another upper molar was extracted. On this occasion he was treated as an in-patient at St. Thomas's Hospital for five weeks: various styptics were applied, and the actual cautery was used several times. For six or eight months after this he was subject to occasional bleeding, sometimes profuse, from this spot. Dr. Walker had to remove a carious wisdom-tooth and a root of one of the extracted teeth which had been left behind. The bleeding was arrested by plugging the sockets with cotton-wool soaked in liq. ferri perch.; this had to be renewed next day, and the patient then had no further hemorrhage. He was discharged at the end of a week, but came to report himself several times afterwards.—*Report Odont. Soc. of Great Britain, in Med. Times and Gaz.*

HINTS AND QUERIES.

"He that questioneth much shall learn much."—BACON.

CORRESPONDENTS desiring a reply in this department are requested to make use of *distinctive signatures or initials*, and avoid the practice of signing their communications Reader, Subscriber, etc.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names. We cannot insert queries or replies except they are so accompanied. Names not necessarily for publication.

Is there any method of inserting *upper* sets of dentures without a plate in the roof of the mouth? Quite frequently I am asked if I can do such work. I tell the applicants of sets on gold with very narrow plates,—they say, without any plate at all.—C. F. MALBON, D.D.S.

WILL some one tell me the best way to be certain that the end of the nerve canal has been reached in preparing that part of the tooth for filling?—R. C. S.

I WOULD like some one to tell how to keep celluloid plates from turning dark-red in the mouth, and how to restore their color after they become so.—J. W. S.

EXTRACTED a left superior sixth-year molar for a lady about three months ago, leaving a free passage into the antrum which does not close, but allows food to pass through. There is slight suppuration.

Will some one please state the best method to heal and close the passage?—S. E. MCD.

WILL the editor of the DENTAL COSMOS please state if the laws of Great Britain give graduates of American dental colleges legal standing as dentists? Are diplomas from any American dental colleges recognized by the Royal Medical Council, the board that passes on the validity of medical and dental diplomas, as giving the holders the same legal status as British diplomas?—X. Z.

[We believe the Council have not recognized the degrees of any American dental colleges except those of Harvard and Ann Arbor,—the discrimination being made that the others do not require a preliminary examination.—ED. DENTAL COSMOS.]

PLEASE state what has been done in the case of Dr. S. P. Chalfant, charged with killing Josiah Bacon.—C. C. S.

[Dr. Chalfant was convicted in the Criminal Court of San Francisco of murder in the second degree, and sentenced, September 20, 1880, to ten years' imprisonment.—ED. DENTAL COSMOS.]

ABOUT two weeks since, Mrs. R. came to me with the second inferior molar aching. On examination I found it a mere shell, with pulp exposed. I filled with Weston's cement, and dismissed her for a few days. To-day she returned to have the cement covered with amalgam. While filling I noticed that when the instrument touched the tongue-holder (Dr. Flagg's) she "jumped." After finishing she was unable to tell which hurt, the tooth or tongue, but thought the former. I tried touching the holder to the filling, with her tongue touching that; the pain was unendurable. I placed a burnisher on the filling, but she experienced no feeling until her tongue touched the instrument; then a slight sensation was felt. In a bicuspid on the same side having a similar filling there was no feeling when it was touched in the same way. Did I do right in allowing that filling to remain? The amalgam was made with a "gold and platinum" alloy.—J. N. W.

A LADY came to have the right inferior first molar extracted. She complained of severe pain with occasional throbbing. I suspected that an abscess was forming, but the gums were not discolored, and she said the tooth had not troubled her until that day. I proposed to treat the tooth, but she wanted it removed at once. I attempted its extraction with the molar forceps, but broke it, and then used alveolar forceps. The sac was attached to one root. There was free bleeding for about half an hour, which then almost ceased, but, having rinsed her mouth with salt and water, violent hemorrhage ensued. I pressed a piece of cotton with tannic acid into the socket, and succeeded in checking it. It had bled violently for two hours. The pain for some days was very severe. I recommended spirits of wine, chloroform, and oil of peppermint, to be used with sage tea as a mouth-wash, which relieved the pain. When I saw her last she was doing well. I wish to inquire if the abscess had any relation to the hemorrhage, and what caused the severe pain to continue so long. Is it better to remove the cotton from the socket, or to let it remain until the gums throw it out in healing? Is the use of alveolar forceps liable to be attended with bad results if three-sixteenths or a quarter of an inch in depth of the process should be included between the forceps?—R. E. B.

A VERY singular case was brought to my notice a few days ago which I thought might interest the readers of the DENTAL COSMOS. I give the history of the case as I had it from the lips of the sufferer, Mr. —, who is, I should judge, about fifty-five years of age. He says he does not remember when he first felt a soreness under his right ear, near the angle of the jaw, but for a long time it gave him a great deal of trouble, and made it difficult for him to shave that part of his face. About ten years ago he remembers going to the barber-shop, and while being shaved was told by the barber that he thought it might be a cancer. The barber advised him to consult a physician, but I believe he did not do so. Others had given the same opinion as to the case being one of cancer, and the gentleman finally came to that conclusion himself. During all this time the soreness increased slowly, accompanied most of the time with itching, twingeing, burning pains, which seemed augmented by the formation of dry scales on the surface; these would fall off after a few days, when the pain would be much relieved.

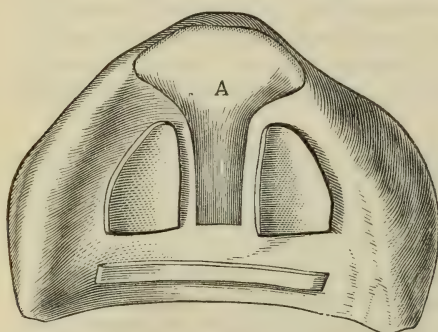
On December 21, 1879, the right inferior lateral incisor commenced to ache, the pain continuing until the next day in the afternoon, when he called on a doctor and had it extracted. The tooth was perfectly sound, and gave no evidence that the pain experienced therein had any connection whatever with the sore on his face,—in fact, he had never had any trouble before with this or any other tooth. Nothing unusual occurred from the extraction of the tooth until a few days after, when a fleshy growth appeared in the socket, which was also very tender and bled at the slightest touch, with a feeling similar to that experienced in the sore under his ear, which in the mean time began to improve. I saw the patient three weeks after the tooth was extracted, when the sore under the ear had entirely disappeared, leaving no tenderness whatever. The gums had also healed, and the gentleman expressed himself thankful that he was at last relieved of that from which he had suffered for more than twenty years. Will some of the wiser ones please to give us a solution of the problem?—F. FENNER.

REPLY TO I. D. T.—“An abscess is a collection of pus, the result of inflammation.” “The cause of ulcer is perverted nutrition, the formative cells losing their plastic power.” An abscess has a tendency to cure itself, the cause being

local; an ulcer, on the contrary, tends to enlarge itself, the cause being generally constitutional. A tooth may become ulcerous through the influence of tartar, the removal of which may cause the ulcer to appear in another location, upon the tongue or lips.

The difference, then, between an alveolar abscess and an ulcerous tooth is that the former is the result of an effort of nature to get rid of an irritating substance, as a dead nerve, or any foreign substance forced through the apical foramen; while the latter is a manifestation of some vice of constitution, aided sometimes by local irritation. An ulcer rarely, if ever, is found at the apex of a tooth, but sometimes upon the periosteum, near its union with the gum.—W. E. PINKHAM.

REPLY TO W. P. G.—The cut will show W. P. G. (August number of the DENTAL COSMOS) how I managed a case in a mouth which presented difficulties in the way of holding a plate.



The case was that of a patient fifty-five years old, whose teeth had been out for years. That part of the mouth shown at A was a perfect callus. Over this part on the cast I laid four sheets of tin, so that when removed it would prevent a bearing on the callus, with chambers on the sides and back part of the plate, as shown in cut. I have no doubt that this will help W. P. G. to a solution of his difficulties.

I made a failure three times, but finally succeeded in this way in getting a good, snug-holding plate. This was eight years ago.—S. M. OVIATT, D.D.S.

ANSWER TO W. P. G.—I had a case a few weeks ago very similar to the one described by you in the DENTAL COSMOS for August, and was tolerably successful after the second trial. Such cases always require the greatest care from the taking of the impression till the final finish of the plate. I use hard rubber, and have been most successful with it in making good fits. In getting the impression I use wax and plaster both, bending the britannia cup if necessary to conform somewhat to the shape of the mouth. Warm a sheet of wax till very soft (I use an alcohol soldering lamp, and only dry heat). Now, having obtained my wax impression, I cut out of its center an oval-shaped chamber an inch long and an eighth of an inch deep for the better accommodation of the hard parts. I then pour plaster over all the inside of the impression,—not too much, but conforming to the shape of the wax somewhat, having the plaster a little thinner than usual; this, when pressed up not too hard, will not displace any of the soft parts. Now, having obtained a good impression, I make the cast, and for an air-chamber use pure tin of an elliptic or oval form, covering the hard ridge and a little beyond, and extending no nearer the posterior portion of the plate than three-eighths of an inch, and of the thickness of, say, three cards of common thickness; then set the teeth as straight up and down as possible, so that the muscles will not tend to bear the plate down. I would not have the anterior teeth quite touch, nor the posterior teeth come anywhere near, the upper plate. In trying to fit a plate where the mouth has been so long without teeth, ever so good an adaptation will not be likely to suit very well the first day or two, and the only way I have found

to secure a fair trial is to get my patient's money in my pocketbook and the teeth in his mouth, with an injunction that he try them faithfully for a week, when he may again call. The usual remark is, "They keep staying better all the time." As a last resort I have known a silver plate to do remarkably well when all other kinds failed.—H. C. M.

DR. W. P. G.—I think your trouble lies in one of three difficulties, perhaps in all three:

1. Your patient may be unable to exhaust the air under the plate in consequence of the deep chambers, and hence gets no atmospheric pressure. These chambers to aid "*suction*" are unphilosophical humbugs. I never make them unless the gum is soft and spongy from great absorption of the alveolus and the hard palate; then *only* to prevent the plate from rocking by the yielding of the gum on the side when the bite is made. I have tried many plates in my own mouth, and know from experience that chambers do no good, but harm. In mastication the plate will generally move, and when pressed up by the bite it will stay up if there is no chamber full of air, for we cannot stop eating and dislodge the food in the mouth to suck up the plate. A plate that fits well will press out the air (if well antagonized) when the jaws are closed.

You speak of a ridge across the posterior of the plate to prevent the "leakage of the air." You do not say whether from under the plate or to prevent its getting under it. If the former, that is the very thing we want; if all the air leaked out when the patient pressed up the plate, it would hold like the plaster impression. Many make broad deep chambers, and then wall them in with a high wall, and make them more inexhaustible than liable to be refilled, could they once be exhausted. Besides the unpleasantness to the patient, such a chamber is really injurious to the palate, the membranes of which soon thicken by inflammation and fill the chamber; then where is the vacuum?

2. It may be that the lower wisdom-tooth you speak of strikes in mastication; if so, that will press the plate forward and out of its place.

3. It may be your plate does not balance well. The pressure should be on the second bicuspid and first molar, and slightly on the first bicuspid of each side. If back of these, the plate will be pressed forward and out of place in mastication. If forward of these, there would be a constant strain on the posterior of the plate, and a tendency to let go of that part, and still more so in mastication. Make some lower teeth and see the difference.—I. N. H., *Woodland, Cal.*

IN answer to W. P. G., in the DENTAL COSMOS for August, I will give him my experience in overcoming the difficulty in a similar case a year ago, and since then two other cases, all doing as well as the most skeptical could wish. I give my plan for rubber, though celluloid can be used as well. Wax up your case in the usual manner, with the difference of leaving the wax very thin over the arch to within three-sixteenths of an inch of the posterior portion of the plate across the arch, where it should be left a little thicker. It is now to be placed in the flask and vulcanized. Remove from the flask and trim off all rough and projecting edges. Take a cast from this plate in plaster, and when hard remove, saw out your air-chamber of usual size clear through the plaster, and with an engine bur cut a groove all round the plate near the base of the teeth, and across the inferior border of the arch, leaving it slightly undercut. Return it to the cast and fill up the air-chamber with plaster, letting a thin layer extend up to within a sixteenth of an inch of the groove. Remove all surplus plaster around and near the edge of the groove and wax up for a second plate, to extend into

this retaining point; place in flask and vulcanize. This will give you a box air-chamber which will stick without any trouble. In packing the above, use tin foil at all points between the plaster and plate. Remove the plaster with fine-pointed instruments, and cut the tin out with dilute nitric acid.

Another way to construct the double air-chamber, which requires but one vulcanizing, is as follows: When ready for packing, place in the arch your lead disk for air-chamber, and around this pack thin pieces of rubber. Your second disk, which should be made of pure tin, having previously been rolled very thin and shaped to the cast, covering as much of the arch as you desire, is placed securely on top of the first disk, and over all another thin layer of rubber. Vulcanize and remove the tin disk with acid, as above. It may be claimed by some that the soft parts will soon fill up the first air-chamber and render it useless, but this is only theoretical, practical use having demonstrated, in cases where I have used it, that it will answer every purpose. Care used in waxing up your plates and using very thin metal for air-chambers when the second, or a very thin layer of plaster when the first described method is used, need not give you a plate of such thickness as to trouble your patient.—D. B. McHENRY.

DARK JOINTS!—Yes, they are very common,—principally for the reason that we are careless, and might do better if we would really try. I seldom have them now-a-days. After jointing up my blocks on a common thin two-inch wheel, I go over them again with a four-inch wheel, inch face. The surfaces should touch from front to back, and if the blocks are held on the wheel with steady hand a joint will be made that needs no after filling in or further thought on account of dark joints. When practicable I set my teeth in the flask and let the plaster stand and harden over-night. If good plaster is used, the blocks will not be moved in the least. In packing I use a tool for cutting the gateway made originally for a rubber scraper. It consists of a piece of steel, say five inches long and of proper thickness, three-eighths of an inch wide, and set in a basswood handle, the cutting end or hoe made rounding on its edge, and bent, say three-fourths of an inch, at an angle of nearly forty-five degrees.

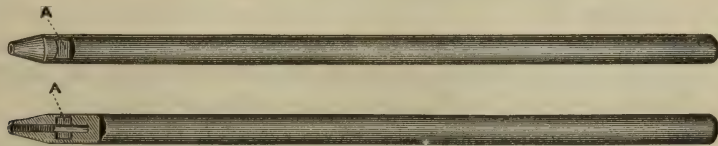
With this I go very near, but not quite to, the place occupied by the wax, hoeing out good deep gateways to the larger V-shaped groove below; then pack with best rubber, which is always the cheapest,—the saving in time occupied in doing work over is more than the difference in cost. When the plate comes out of the flask break off the *horseshoe* around; the plate is thus trimmed in from one to two minutes. I consider good plaster an important factor and aid to good work. I had much trouble in former years to obtain good plaster uniformly, but now have much satisfaction in the use of a perfectly reliable article.—H. C. M.

REPLANTATION.—In November, 1879, Mr. A. T. Maxwell, of Hampton, Ga., made application to me concerning an injury he had received while riding on horseback. It was then two weeks after the accident had occurred (his horse falling with him) by which he had his two upper central incisors knocked out. One of the teeth was found and replaced soon after the accident, and was yet a little loose in its socket. He was much concerned about the loss of the other tooth, saying he would rather have it in place as it was before the accident than have the highest gift in the hands of the American people. He had not yet found the tooth, though he had spent much time in searching for it. I told him that the time had passed, I thought, for a successful operation, but that I would make the experiment in case he found the tooth without much further delay. In one week after this time he returned with the tooth in his possession. I was really

sorry to see him, and did my best to discourage him from having the replacement attempted. He insisted upon it, however, and I concluded to make the effort. The tooth had the appearance of an old bone, whitened by time. I took off enough of the apex of the root (say the sixteenth of an inch) to give me a clear opening into the nerve-canal, which I filled with gold. I then cut three grooves longitudinally with the root, from the beginning of the cementum to the apex, to serve as drains to conduct away any morbid secretions that might collect in the socket. Then, with a corundum wheel, I ground the entire surface of the root very slightly to allow for the little contraction I supposed three weeks would have caused in the alveolar walls. I then placed the tooth in a glass of tepid water to await the preparation of the socket, which I began (after putting my patient well under ether) by making several incisions in the margin of the gum, which had contracted over the entrance of the cavity. After obtaining free access into the socket and cleansing it well with carbolic acid and glycerin, and subsequently drying it, I pressed the tooth well up to its place. I took an impression in gutta-percha and wax of all the upper teeth, holding the newly-planted tooth in place with a crooked instrument. From this I obtained a plaster model, over which I fashioned a plate of gutta-percha to act as an interdental splint in retaining the tooth in place until a more permanent one could be made. This splint he wore one week, when I made him a permanent one of Holland's metal, which he wore until the tooth was reasonably firm. I saw the patient once a week for two months. He is now, after nine months, using the tooth as he did before the accident, and it seems as firm as any tooth in his mouth.

Queries: Nature had set about to repair the damage of this accident, and had continued in her work three weeks, when this interference by replanting changed the whole process, by wounding anew the injured parts, and inviting nature to work in apparent violation of her own laws. Then, by what process is the tooth retained? Is it by osseous contraction alone, or assisted by renewal or renovation of the periosteum? In what condition was the periosteum after the accident? Did it remain intact upon the walls of the socket and throw out lymph to fill the cavity, and then after its removal was this membrane ready to receive the tooth again? Is there a case on record of replantation after such a lapse of time?—
S. G. HOLLAND, *Atlanta, Ga.*

BONWILL CROWNS.—In the excellent illustrated article on the subject of pivoting teeth by the plan suggested by Dr. Bonwill, in the August number (1880) of the *DENTAL COSMOS*, the doctor says: "If so unfortunate as to injure the thread, repair it with the little screw plate, as shown in Fig. 8." I desire to suggest a plan which I have used, whereby the barbed pivot, with the screw on the end (which had been secured in the root with amalgam) may be bent without danger of defacing or injuring the screw. A small instrument may be easily made of a piece of iron wire, as will be better understood by the following figure:



The sectional view represents a screw-thread cut on the inside. The slot "A" is made to facilitate the cutting of the screw-thread within, which for amateurs is somewhat difficult without it, the thread corresponding to the one used on the

pivot. When desirous of bending the wire or pivot at the proper angle, screw the instrument on to the pivot, and the bending may be done without fear of bruising the threads, which on the platinum wire used for the pivot is very easily done, as that metal is quite soft. Two of these instruments will be required, one for the thread used on large centrals and cuspids, the other for small centrals and laterals.—THEODORE F. CHUPEIN, D.D.S.

PORCELAIN CROWNS.—The very interesting and practical article in the August number of the *DENTAL COSMOS* by Dr. Bonwill opened up new ideas on porcelain crowns. The next day after receiving your valuable journal a case in point presented itself. A young lady patient, having broken off the buccal cusp from her first upper bicuspid, had it built out by a brother operator with os-artificiel, which had failed to stand the force of mastication. I advised her to have it built out with gold. But, on removing the filling, I found the decay had made such ravages on the approximal surfaces that it was impossible to put the rubber dam on sufficiently close to keep off the secretion or to prevent hemorrhage during the necessarily tedious operation. Thinking of Dr. Bonwill's suggestion, I took an artificial bicuspid, ground it down flat, and, removing the pins, cut it off and fitted it nicely; then cut a deep dovetailed groove lengthwise in its lingual surface; then warmed gutta-percha, and fitted it so as to perfectly replace the missing cusp. Next I took an impression and fitted a band very closely around the whole tooth; removed the band and gutta-percha; made good retaining points in the remaining cusp; placed the porcelain cusp in position, and again forced the band over the tooth; kept it firmly in position, and packed the cavity between the cusps with the best amalgam, allowing it to harden for forty-eight hours. I then removed the band and polished the amalgam. The young lady has eaten every meal on it since, and it would take an expert to tell the artificial from a natural cusp.—E. G. SMITH, D.D.S., *St. Paul, Minnesota*.

THE RECENT BRITISH DENTAL ACT AND OLD PRACTITIONERS.—The passing of the Dental Act of 1878 having rendered it compulsory on those entering the dental profession to be specially educated in dental matters, all must hold a diploma. There are a great number who are already in practice but hold no diploma, who are anxious to appear on the list as qualified men, but under existing circumstances cannot afford to give the necessary time to study. Could not the American examining boards grant to any respectable practitioner whose name is on the dental register the same privilege as the examining boards in England, Ireland, and Scotland,—viz., examination for the D.D.S. diploma *sine curriculo*? I feel sure a large number of practitioners from England and elsewhere would rejoice at the opportunity so given. I am satisfied the curriculum men would not feel that an advantage had been taken of them, but would show the same spirit they have always done in assisting to elevate the profession, the dignity of which would be raised by more general qualifying of its members.—J. MASTERS, *Manchester, England*.

CORRECTION.—In the "Reply to W. P. G.," by G. W. A., in the September number of the *DENTAL COSMOS*, page 511, fourth line, in place of the words "after removing from the mouth," read "*after making the cast*," etc.

A COMBINATION.—Amalgam, with mercury enough to form a powder but not a paste, and an equal quantity of oxyphosphate of zinc cement, thoroughly mixed and worked together make a superior plastic filling material, combining the good qualities of both the amalgam and cement—hardness and adhesiveness.

—B. H. T., *Aiken, S. C.*

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ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to Act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the office of the Librarian of Congress at Washington.]

(Continued from page 463.)

THE treatment of cases of *fourth grade* periodontitis of the *second* class, though somewhat complicated, is, nevertheless, very simple when compared with that of cases of the first class.

These pertain to such patients as, "without undue nervous perception to irritation, are yet lacking in the tissue essentials to prompt recuperative effort."

For such the work of making a "vent" is an operation which is accomplished with comparative ease, although there is, necessarily, some infliction, yet with attention to the directions which have been given as to counter-pressure and "traction"—putting a ligature around the neck of the tooth and letting the patient draw upon it (DENTAL COSMOS, November, 1878, page 581)—there is usually no pain of which complaint will be made.

It has been stated that, with patients of this second class, the venting is almost always attended with so much relief as to render treatment for "resolution" so apparently indicated as to be instituted; it has also been mentioned that several hours—perhaps a day—may supervene before such cases are assuredly ranked as belonging to the *fourth grade*; but the reappearance of the *decided* symptoms of periodontitis within this space of time may, quite universally, be regarded as ample reason for immediate change of treatment.

It is in connection with these cases that one of the anomalies of therapeutics should be mentioned, and so impressed as to secure its remembrance; this is, that the stimulating treatment, which is

specially pushed to the *full* extent of the patient's endurance, to insure increased pathological complications, will sometimes subserve the very different purpose of clearing away all vascular obstruction and eventuate in a totally unhopd-for resolution.

This relegates an accepted *fourth* grade periodontitis back to the position of *third* grade; but as the existence of this *possibility* is, like that of the existence of "pulp-nodules" or "absorption of permanent roots," a condition not to be positively diagnosed, I shall feel that I have done my duty in the careful mention of it.

NOTE.—In seeking for reference to remarks on "stimulation" as a means for "resolution," during treatment of third grade periodontitis, I find that its discussion has been omitted. In the DENTAL COSMOS, April, 1880, page 175, will be found "The *third local consideration* in treatment of inflammation is given as 'the application of tonic, astringent, stimulant, counter-irritant, or sedative remedies, as the case may require.' " It should have been mentioned in the DENTAL COSMOS for May, page 232, that next in order to cooling antiphlogistics we have *stimulating* antiphlogistics, and the only method for correcting the omission seems to be the discussion of this point now, parenthetically.

"*Stimulation*" as a means for "*Resolution*."—At the commencement of my articles on Dental Pathology and Therapeutics I endeavored, in the first thirty pages, to construct a concise review of basal principles that should serve as the foundation upon which to erect the superstructure.

In the DENTAL COSMOS article of August, 1872, upon pages 410 and 411, will be found remarks bearing directly upon the subject in hand. Speaking of the resolution of inflammation it is there said, "If cool applications afford comfort, and gradual restoration is observed to progress, this result proves the efficiency of the treatment; but if, on the contrary, pain supervenes after a period of cessation, and increases in violence, *warm* applications may be resorted to with benefit."

"These are beneficial through stimulation in less degree than is irritating. The sensation of comfort is here again the guide, and the application should be such as shall maintain continuously that degree of heat which is *easily endurable* and *pain-obtunding*."

It will therefore be observed that failure to give ease upon the part of constantly applied sedative and cooling medicaments is the indication for the abandonment of that range of remedies and for the substitution of *stimulants*.

As I have referred to the surprising efficacy of cool mouth-lotions in many cases, so must I accord to warm mouth-lotions an equal degree of comfort-giving power in cases where they are found experimentally to be indicated.

Warm hop-tea, warm ginger-tea, warm infusion of red pepper,

weak, are each, in place, very useful and acceptable as means to attain the end of *continuous stimulation in such degree as is easily endurable and pain-obtunding*.

A mixture of chloroform and tincture of capsicum, equal parts, has been a favorite application in these cases with me for many years; the mixture should be well shaken before using, as the two ingredients separate almost immediately. The best method of applying this stimulant is upon a single thickness of muslin; this is moistened with the mixture and placed upon the gum over the affected and the adjoining teeth.

I have tried to impress, by repetition, the rule which governs stimulation directed for the purpose of effecting resolution, and there is no other medication which, in my experience, differs so decidedly in its proper frequency of application.

With one patient a moderately warm mouth-lotion of hop-tea will be just right, and a comparatively infrequent renewal of the fresh mouthfuls will be all that is essential to comfort, while with another the frequent renewal of large mouthfuls of strong ginger or even capsicum infusion, and this very warm, will be required to attain the result of "easy endurance" and the giving of relief; but for each and every one this is the point at which to aim.

In the chloroform and tincture of capsicum medication, the difference between patients in the possibilities of frequency and strength of application is even more marked than in the use of mouth-lotions, some requiring a dozen or more liberal applications on muslin pads of three or four folds, during the day, and others tolerating only two, or at most three, renewals of one or two drops each on a single thickness of muslin. All grades between these two extremes are met by the universal direction, clearly given, to use the remedies in such degree of warmth, of strength, of quantity, and of frequency as shall secure a *continuous stimulation which is easily endurable and pain-obtunding*.

For intensity of stimulation I have referred to the ginger-bag and pepper-bag applications, but I would also say that in such cases as require *decided stimulation for the insuring of resolution* these little pads are a most convenient means for essaying the attainment of this result.

It must be appreciated that these are only to be tried in cases where cooling antiphlogistic and gently stimulating antiphlogistic treatment have alike proved unavailing, and it may safely be regarded that, in such, the limits of the possibilities for resolution are exceedingly constricted.

Under such circumstances the peculiar action of continued application of capsicum is that if it does not succeed in producing the

effect immediately and avowedly worked for, it yet aids directly in securing the next best termination to the existing inflammation, which is suppuration.

Under all circumstances, and under the institution of whatever treatment for the obtaining of the resolution of periodontitis, it is proper to maintain a continuance of treatment for a shorter or longer period after the desired result is quite positively assured.

The object of this is to afford that "support" to the tissues and that aid to the controlling powers of nutrition—innervation and circulation—which shall preclude a liability to subsequent prostration from previous irritation, and insure the continuance of "reaction" to the degree of self-supporting strength.

The period of duration, and the gradation of power which should be given this treatment for support, depends upon the age, general strength, and present condition of the patient.

If the patient is youthful, with good recuperative attributes, and is in fair condition so far as health is concerned, moderate support for two or three days, diminishing rapidly in gradation, will meet all requirements; for such the continuance of occasional applications of tincture of aconite, once daily, for two, three, or four days, aided by an infrequent use of laudanum or hamamelis on muslin pads, will be all-sufficient. For patients of more advanced years, upon whom the duties of life make greater demands, whose recuperative energy is more severely taxed in varied directions, and whose general health is not fully up to average, more decided support, and that persisted in for a longer time, is alone able to meet, safely, the requirements. With these such topical medication as has been found necessary to effect resolution should be maintained almost continuously, and with but little, if any, diminution in power for at least a day or two after perfect comfort has been attained, and should then be *gradually* discontinued through a period of from two to four days. Even after this a possible return of trouble must be recognized and watched for, and prompt measures taken in the veriest incipency for the suppression of any tendency toward "relapse."

If patients are past middle life, and especially if they are elderly,—sixty-five or seventy years of age,—it must be remembered that the vital force is markedly declining, and that even though extraordinary vigor, *for that time of life*, may be possessed, yet it is not well to rely upon it in cases of peridental inflammation.

It is usual for the passing of sixty-five or seventy years to leave but a limited number of teeth capable of doing duty; it is usual that even these are much less firmly supported than is normal, in consequence of recession of gum-tissue and of the alveolar processes; it is frequently, and indeed almost universally, the case that more or

less of mal-occlusion exists, and all this is unfavorable for dental convalescence.

In these cases the continuance of supporting treatment, and the gradation of its cessation, cannot be best conducted by anything less than the utmost care and skill.

Delicacy regarding the feelings of such patients should be specially cultivated, as there is probably no point upon which most persons are more sensitive than that of the failure of power; treatment should therefore be *directed* with the full recognition of the existence of this condition, but without the least apparent reference to it; the more decided measures of antiphlogistic tendency should be gradually lessened in degree; these should be replaced, in the course of two or three days, by the laudanum, or laudanum and tincture of arnica,—half and half,—applied by the patient several times daily on small pieces of muslin; this medicament should be of its usual strength if it produces no infliction, but if it vesicates, or is even too hot, it should be diluted so as to make of it a soothing and quieting application.

It is at this point that remedies of another class are very appropriately employed; these are *astringents*,—of which we have *krameria*, catechu, kino, tannic acid, granatum (pomegranate rind), and the tinctures of the muriate and persulphate of iron; of these the application of either of the tinctures of iron, diluted by the addition of an equal amount of paregoric, is one which should be made by the practitioner: it is applied on the gum with a camel's-hair pencil; and of the other astringents I prefer either the tannin in powder, the *krameria* in tincture (somewhat diluted if the alcohol is too strong), or the granatum in decoction.

Any of these may be, and indeed should be, applied by the patient; the tannin, in small quantities, from the end of a finger; the *krameria*, by saturating small pieces of muslin; and the granatum, by occasionally holding in the mouth portions of a reasonably constringing decoction.

I would not be understood as implying that astringent support is indicated *only* in the treatment of cases of periodontitis pertaining to elderly patients, nor that it is *always* to be used even in these, but that it is more likely to prove beneficial when tissue response has been weakened by age is, in my experience, unquestionable.

It will also be useful in cases of periodontitis induced by, or contemporaneous with, pregnancy; and again, in cases of female patients when these have been mothers of large families, and to whom the systemic drain pertaining to gestation, lactation, and the cares incident to maternity has been unusually depressing. And again, astringent support is sometimes indicated in periodontitis of young

patients; but, as a rule, these must be of asthenic type, with soft and irresponsive tissue, such weakness being due to heredity or to severe or continued sickness.

Frequently it will be found that the teeth of *elderly* persons which have suffered severely from periodontitis, and in connection with which resolution has been effected, will *never* regain so nearly a condition of normality as to prevent the "knowledge of the presence of the tooth" for any great length of time consecutively.

These teeth will not give sufficient trouble to warrant extraction, or even to cause any willingness on the part of the patients that they should be extracted, but they are liable to be made "sore" from an unduly hard bite; from a too constant use; from changes of weather, and, most surely, from the lapse of time; they are desired by their possessors, but are always spoken of apologetically as "a good deal better than no teeth, and better than having artificial ones."

These teeth, of all teeth, should have the "relieving tap" carefully arranged, for the varied reasons that relief will *probably* be demanded at comparatively short intervals; that it will thus be afforded in the promptest, easiest, and most acceptable manner; and that in this way such teeth can be retained for years longer than they could be by any other treatment.

Induration.—"The hardness which supervenes occasionally in an inflamed part."—*Dunghison*. When writing of the results of inflammation, DENTAL COSMOS, August, 1872, I referred to "effusion," speaking of it as a filtration of a fluid through the cellular structure which is found between the ramifying nerves and vessels.

I stated then that this fluid, when concomitant with "congestion,"—which I placed as the second or intermediate stage of altered circulation,—might be regarded as merely "watery," and as producing swelling from the presence, outside of the capillaries, of the more soluble constituents of the blood in the effused water of the blood.

I stated that this sort of effusion was viewed as that of non-organizable fluid, and that it was easily and rapidly absorbed upon the removal of its exciting cause.

But it was also taught that, as irritation continued, and true inflammation supervened, the characteristics of the effusions became changed,—that their consistence was more dense; that in them were found little corpuscles which were called "exudation corpuscles"; that they became, in varied degree, *organizable*, and that they were called "coagulable lymphs."

In general pathology the two degrees of organizability are denominated *enplastic* and *cacoplasmic*; the first, *enplastic*, having reference to that high capability for organization which pertains to the best and healthiest lymph, and the second, *cacoplasmic*, denoting the effu-

sions of low grades of inflammation, anæmic (deficient in red corpuscles) and adynamic (deficient in vitality), and yet possessing sufficient capability for organization to prevent "degeneration" (breaking down).

It is, then, through *enplastic* effusions that "healing by the first intention" is accomplished; that large reparation of tissue is produced by "healthy granulation"; and that *indurations* of a certain kind sometimes eventuate.

Indurations of this kind are found in the substance of tissue of good quality; they may be recognized as the results of high grades of inflammatory action which, from disadvantageous controlling circumstances (usually depressing systemic influences), had assumed a "subacute" form.

In the DENTAL COSMOS for July, 1872, first page, the classification of inflammation from "length of duration" into *acute*, *subacute*, and *chronic*, will be found.

In general pathology the varying length of time which governs this is accepted as being from a *few days* up to *three weeks* for *acute*; any inflammation continuing more than three weeks, and as long as *six weeks*, is considered as *subacute*; if inflammation continues longer than six weeks it is regarded as *chronic*, indefinitely.

In dental pathology these governing periods are very different; for, in inflammation of the pulps or of the peridentium, any duration of such condition which continued for a period not exceeding *one week* could alone be called *acute*; from one to *three weeks'* continuance of inflammation in or about a tooth would certainly rank it as *subacute*; and any inflammation which was still in progress after a lapse of three weeks would properly be regarded as *chronic*.

The reason for this is found in the comparatively limited amount of tissue which can be involved, and the anatomical peculiarities which seem almost to preclude the possibility of the continuing of any reasonably high grade of inflammation for more than from four to seven days without culminating in one of the two terminations,—resolution or suppuration.

It is from these cases of sthenic, circumscribed, dynamic inflammation that we obtain our types for the *acute* inflammations of dental practice.

Inflammation of lesser degree, such as in extent of tissue or in parenchyma of large organs would require from three to six weeks to run its course, would, governed by the dental peculiarities of small bulk of parenchyma and unyielding surroundings pertaining to dental pulps, and the limited extent of tissue and almost equally unyielding surroundings of the peridental membranes, be compelled to terminate in from two to three weeks.

Under the same influences that would insure these modifications of time in the classification of inflammatory degree, only that asthenic, diffused, and adynamic form of inflammation which, in general practice, it would seem possible could continue for any length of time, from six weeks to any number of years, so long as it had tissue to feed upon, could make such slow progress as to be still inflammatory, and no more than inflammatory, after a trying endurance of three weeks.

But here the distinction ceases, for, having pronounced itself *chronic*, it, like inflammation in any other part, may continue almost indefinitely.

I have spoken of indurations from enplastic effusions from systemically controlled sthenic inflammation, and would now say of them, that they are usually circumscribed in extent, and are generally removed by unaided efforts on the part of the absorbents; occasionally they will require a little assistance, and when this is demanded, a few touchings of the indurated tissue with *ordinary* tincture of iodine will almost always accomplish the desired result. This should be done carefully, thoroughly drying the contiguous gum-tissue, and remembering the decided tendency of the medicament to "run."

Indurations from *cacoplastic* effusions are not so easily treated, but grade themselves in all degrees of difficulty, and with very varying extent.

(To be continued.)

SOME OF THE CAUSES OF LOSS OF THE TEETH IN THE ADULT.

BY CHAS. J. ESSIG, M.D., D.D.S.,

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(Read before the Pennsylvania State Dental Society, July, 1879.)

HAVING been requested to read a paper before this society, I have hesitated in the selection of a subject; and in deciding upon a consideration of some of the causes of loss of the teeth in the adult, I have been governed somewhat by the belief that at meetings of this character, we should devote more time to the consideration of morbid conditions of the dental organs and contiguous parts than we do. I think we should at least divide our attention equally between the consideration of mechanical appliances and improved methods of filling teeth, and the study of pathological conditions, some of which are such prolific causes of loss of the natural organs.

It is becoming a serious question whether that fertility of inventiveness, which has placed in the hands of the American dentist so many mechanical appliances and labor-saving instruments, does not

exert a very hurtful influence in hindering the acquirement of scientific habits of thought, the power of original research, and the ability to recognize the prodromic signs of the diseases which it is his province to treat.

I do not wish to be understood as undervaluing the very exhaustive manner in which these appliances and different methods of operating have been discussed, in the last ten years, at the meetings of our societies and in our journals; but in the study of dentistry there are other equally important objects to attain besides the acquirement of mere manual dexterity; and while admitting that dental caries is in skillful and conscientious hands quite amenable to treatment, we should not lose sight of the fact that there are other lesions affecting the usefulness of the dental organs, the etiology, pathology, and treatment of which we have hardly begun to study.

It is not my purpose to attempt anything like an exhaustive review of all the causes of the loss of the teeth. I shall confine myself simply to a consideration of some of the prominent features of those lesions characterized by the death or recession of the connective tissue and investing structures of vital teeth. The most important of these, because the most common lesion of the class, is the so-called "Riggs's disease," variously designated as absorption of the alveolus, atrophy of the alveoli, necrosis or caries of the alveoli. If I am correctly informed, the term "Riggs's disease" applies only to loosening of the teeth in consequence of caries of their alveolar investment. But whether this death and elimination of the part is due to some cause peculiar to the alveolus, or merely a sequence of the death of the connective membrane by which the function of the bone is suspended, and followed by its removal, in accordance with a well-known law of nature, is as yet an unsettled question. The primary cause is probably systemic: it usually makes its appearance in mouths remarkable for almost complete immunity from decay; and this fact has led to the assumption that such evident power of resisting the usual causes of decay until middle life implies extreme density and low degree of vitality in the structure of the teeth, resulting in a final severance between them and the more highly vitalized contiguous parts, thus constituting a predisposing cause of a disease liable to be developed by an accretion of calculus or other excitant. Adopting this hypothesis, the treatment, beginning in the incipency of the disease, would necessarily be prophylactic in character.

I am aware that many practitioners believe this lesion to be of a merely local character, due solely to the encroachment of a peculiar form of calculus, and the suppuration to be produced by the exciting presence of the calcareous deposit; but the entire absence of a deposit in some cases, the sanious character of the discharge, and the fact

that the disease may make its appearance in an acute form in teeth previously unaffected, seem to me to decide the question in favor of its being a local manifestation of a constitutional cause, and the calcareous deposit merely an accident of opportunity.

I have never observed a well-marked case in the mouth of a person under years of maturity; it is probable, however, that the prodromic signs of this disease are frequently overlooked, and that it commences at a much earlier period than is generally supposed. Age can scarcely be considered a predisposing cause of the disease, for while it usually makes its appearance in the mouths of young adults, and slowly progresses until late in middle life, I am led to think that after that period its occurrence is much less frequent, and I have examined teeth in which the disease, after the age of fifty, seems to have subsided spontaneously, leaving an entire root or part of a root of a molar tooth entirely uncovered. Some of these offer striking examples of the ravages of the disease. In the mouth of one of my patients, sixty years of age, is a superior molar tooth with the anterior buccal root entirely bare to its apex, and from what I can glean of the history of the case its investment was removed in the progress of the morbid condition under consideration.

Pathology.—"Riggs's disease,"—so called because Dr. Riggs has the credit of being the first to call attention to the true pathology of the lesion,—properly speaking is caries of the investing tissues constituting the dental socket. That it is caries is abundantly established by the sanious character and peculiar odor of the suppuration; there is nothing to indicate that the alveolar plate is removed by absorption; it is not taken up, but is eliminated; usually only a portion of the socket of a tooth is affected, although the entire circumference may be involved. Chronicity is a prominent feature of it, though it may assume a decidedly acute form; usually it commences at the margins of the gum and progresses slowly for ten, fifteen, or twenty years, until finally the tooth loosens and falls out, or in consequence of the discomfort caused by the pressure of antagonizing teeth that result is anticipated by the forceps, until eventually, and sometimes before the patient has reached middle life, the artificial denture has become necessary.

The precursory symptoms in a case which I had the good fortune to watch for more than ten years made their appearance at the age of twenty-eight, and consisted of tumidity at the margins of the gums, and particularly of the festoons between the teeth, and a disposition to bleed freely, sometimes spontaneously, and always upon the slightest pressure; indeed, this is a very constant symptom of the disease, and not infrequently causes great alarm until an examination has revealed the cause. The gum immediately over the affected

spots assumed a dark purple color, and where the disease was confined to a narrow strip of the alveolus, corresponding to the long axis of the tooth, the only perceptible evidence of its existence was a dark purple line immediately over the affected part, and an examination with a suitable probe at this point revealed the absence of a portion of the alveolus beneath, and the instrument would pass nearly to the apex of the root.

When the disease is thus circumscribed, the uneven edges of the alveolus on either side of the seat of the lesion can readily be detected by the finger, seemingly intact; it is this condition which prevents recession of the gum, and constitutes the sinus or pocket which so greatly complicates the disease, often defeating the most persistent therapeutic efforts by affording a place of lodgment for the purulent discharge, calcareous matter, and other irritating objects.

Slight pressure along this dark line or sulcus quickly brings to view an amount of pus of a peculiarly offensive odor, varying in quantity according to the extent of the disease.

Among exciting causes I am inclined to class an irregular or crowded state of the teeth; in the case I have referred to the first tooth affected was the left inferior canine, which had been crowded quite outside of the arch; the other conditions being favorable, the undue pressure upon the outer plate of the alveolus developed the disease, and, although other teeth were subsequently affected, this was the only one in which the lesion was accompanied with neuralgic pains.

In many cases where the disease is more diffuse the increased vascularity which causes the purple hue of the gum will be general, indicating that the greater part, if not all, of the alveolus is affected, and probably in consequence of this extra-vascular condition bony nodules or prominences will be observed to have formed over or in the immediate vicinity of the affected teeth; these prominences are not common in the superior maxilla, but are frequently met with in the lower jaw in mouths which have for a great length of time been affected with caries of the alveolus.

As I have stated, the disease may assume an acute form. In the case which I have mentioned, more than ten years after the first appearance of the disease the gum contiguous to the second superior left molar, previously healthy, was affected with all the phenomena of alveolar abscess: the usual throbbing and swelling, the latter, however, confined within narrower limits than usual, and not extending to the cheek; the investing membranes were thickened, causing elongation of the tooth in its socket, with such exquisite tenderness that for the time mastication was entirely suspended. The case being shown to a professional friend, he expressed the suspicion that the pulp

was devitalized, and that we had a typical case of alveolar abscess. Acting upon his suggestion, the usual cold-water test was applied to the tooth, and it responded so promptly that no doubt remained of its full vitality; a few hours later the swelling was lanced, releasing a considerable quantity of pus, after which the tenderness speedily subsided, and the tooth and surrounding parts seemed to have returned to their normal condition, but it was soon discovered that a considerable portion of the alveolus between the affected tooth and its immediate neighbor was lost; to the finger there was a perceptible depression in consequence of its absence, and the well-defined edges of the remaining alveolus were readily detected. The tooth never regained its firmness, but remained perfectly comfortable for some months, when the same train of phenomena made their appearance on the palatal investments, ran the same course, and subsided in about the same time, but left the tooth much looser than before. Subsequently a lower molar was affected in the same way, and after resuming its previous condition of usefulness it was observed that a sinus, with the usual purulent discharge, had become established, and the lesion seemed to lapse into the more frequent chronic state, but was liable at intervals to become very tender, and the tooth would project from its socket to such an extent that mastication could not be performed until these phenomena subsided. It will be observed from the description of this case, the record of which has been conscientiously and carefully kept, that the acute form of caries of the alveolus may be mistaken for alveolar abscess resulting from a devitalized pulp, and that a differential diagnosis is not always easy. In similar cases teeth with vital pulps have been opened by mistake. The mere presence of pain, swelling, and pus is not always to be regarded as indicative of the death of the pulp of an affected tooth; much the safer diagnostic sign is obtained by the application of the cold-water test before opening into the pulp-chamber.

Treatment.—The etiology of the disease is so obscure that thus far all treatment has been of a palliative character or directed to the removal of exciting causes; of its predisposing cause nothing is known, beyond the fact that it is often hereditary, that those who are affected with it enjoy, as a rule, the most robust health, and that the teeth themselves are generally well developed and dense in structure.

In cases where I have had reason to suspect a tendency to caries of the investing plates of alveolus, my plan has been to act upon the hypothesis that, in consequence of some peculiar organic condition, the union of the connective tissue with the tooth was enfeebled, and it merely required the encroachment of calculus or the lodgment of an insoluble constituent of a dentifrice beneath the margins of the gums, or the use of an improperly-selected tooth-brush, to cause a

severance and the establishment of a sinus or pocket, offering a lodgment for irritating substances, after which the progress of the lesion becomes more rapid, and its treatment more difficult; hence my treatment has been to remove all foreign accretions at what might be considered the incipency of the disease, before the establishment of the pocket, and to direct my patient to observe the utmost cleanliness, to brush the teeth thoroughly after every meal with a moderately soft brush, and for the removal of mucous deposits between the teeth to carefully rinse the mouth at least three times a day with a solution of

Chloride of zinc, gr. x.;
Aque, ℥j.

The thorough removal of all foreign accretions becomes a *sine qua non* to the arrest of the progress of this disease, but care should be observed, in the removal of calculus, not to unduly wound the gum, or to further separate the teeth and connective tissues; the indiscriminate scraping which seems to be regarded by many as the remedy *par excellence* for the lesion often, I am convinced, only accelerates its progress. All deposits of tartar within easy reach of an instrument should, of course, be removed by that means, but the more scanty layer situated far in towards the extremity of the sinus can be got rid of more perfectly by packing small rolls of cotton saturated with aromatic sulphuric acid; by this means we are enabled to soften the calcareous deposit, while at the same time we obtain the other therapeutic effects of the agents in giving tone and stimulating healthy granulation. The peculiar form of lime deposit met with in this disease is of great hardness, as any one will find who attempts to remove it from a tooth which has been extracted, and I can conceive of no process of scraping the roots of teeth in the mouth which promises thoroughness, neither have I ever seen an instrument with which such a result would seem to be attainable. The roots of teeth are rarely so even and uniform in shape as to permit of anything like complete removal of the accretion by scraping; indeed, in many cases a narrow sinus not infrequently extends under the bifurcating portion of the tooth. Such a position would defy the most skillful and persistent hand to effect the entire removal of the lime deposit, yet the effect of very dilute aromatic sulphuric acid upon this material is to render it so soft in one hour's time that it can almost be washed away with a syringe, and the most delicate barbed scaler will be sufficient to remove it with but little force.

I have at different times in the treatment of this lesion employed—requiring the conditions of cleanliness already noticed—iodine, iodine in carbolic acid, nitrate of silver, chloride of zinc, and aromatic sulphuric acid. The means of applying the agent was to arm a

piece of wood cut to a thin edge with cotton, by which means the remedy could be carried to the very extremity of the sinus or pocket. I will merely say that while by the use of these agents I believe I have retarded the progress of the disease, yet I never by their agency in long-established cases succeeded in effecting a permanent cure.

In the treatment of the case to which I have alluded, aromatic sulphuric acid was freely employed; it was applied half strength upon pellets of cotton pressed into the sinus or pocket, and allowed to remain for a day. After two or three applications a marked improvement was noticed, particularly in teeth around which the lesion had not attained much depth; in these the suppuration had entirely ceased, but I soon found that any abatement of the patient's efforts in the direction of cleanliness was speedily followed by a return of the discharge.

I have stated the belief that the deep sinuses or pockets caused by the death of the peridental membranes greatly add to the difficulty of effecting a cure; I have supposed that it was not possible by any line of treatment to induce a reproduction of this tissue and make it again adhere to the root,—in short, to restore the tooth to its former integrity. Dr. C. G. Davis, in the April (1879) number of the *DENTAL Cosmos*, uses the following language: "I had the satisfaction of seeing the very wide and deep pockets of the teeth first operated upon entirely closed with new tissue, and the teeth themselves quite firmly set,—indeed, nearly as fast as the teeth not affected." The inference here is clearly, that both reproduction and reunion were effected; the language, however, might have been more explicit on so important a point. I have occasionally, where the sinus was nearly accessible, as when situated on the labial surface of a canine tooth, slit the gum constituting the pocket with a delicate curved bistoury to its full extent for the purpose of breaking up the place of lodgment. The same result may be obtained by the frequent use of aromatic sulphuric acid full strength.

In reviewing the results of my efforts in the treatment of caries of the peridental tissues, I feel bound to admit that they have not been as positive in cases of long standing as some recent writers have claimed for themselves. Much depends upon the full co-operation of the patient; when we have this we may palliate or retard the progress of the disease, and when taken in time we may effect a cure.

There are other forms of gum lesion resulting in loosening and final loss of the teeth which depend upon certain phases of atrophy—or, as it is more frequently termed, "absorption"—of the alveolar investments, or of the roots of the teeth themselves. A very remarkable case of atrophy of the roots of all of the teeth in the superior arch came under my notice seven years ago. The patient, a lady, came for

advice about a very loose central incisor. I observed a very general ulitis; all the teeth were more or less loose, and there was slight ulceration and much tenderness around the margins of the gums; these were treated by sulphate of zinc, applied with a pencil, and astringent mouth-washes. The ulitic features of the lesion soon subsided under this treatment. It was evident, however, that the disease had been going on for a long time, and that some of the incisor teeth must soon be lost. Within a few days she brought me the central tooth, which had come out while eating. I was surprised to find that the entire root was gone. (Ultimately all the superior teeth were lost. The lower teeth, though still *in situ*, are infirm, and the same ulitic condition prevails.) The absorption had gone on so uniformly and equally that the root exhibited simply loss of bulk; its shape had not materially changed, but was as gracefully rounded off as though it had never been of greater length. The pulp-canal, instead of being open and largely exposed, was about of the normal size. I am indebted to Dr. H. Garrett, of Wilmington, Del., for a specimen of another form of atrophy of the roots of teeth; the patient, a very robust gentleman, in the prime of life, had a very loose central incisor, which I here exhibit. I had the good fortune to examine the tooth before extraction; it was simply elongated, loose, and very tender, but all the surrounding teeth were unaffected, and have remained so. It will be observed that the absorption has at one point quite reached the enamel, that it has the appearance of having been fractured, leaving a very uneven surface, but it will also be noticed that as the retrogressive process has gone on the pulp-chamber has simply receded, and that the opening through the root is no larger than is often normal.

The cause of this lesion seems to be exceedingly obscure: we only know that something has occurred to disturb that physiological balance existing between waste and repair. One of those functions may predominate and go on at the expense of the other, and we may have atrophy or we may have exostosis as the case may be; thus if nervous supply is interfered with nutrition is suspended, but, the function of the absorbent vessels being unimpaired, loss of bulk—atrophy—is the result. The treatment of this lesion can only, in the present state of our knowledge of its etiology, be confined to symptoms. Any recognizable exciting cause should be removed, and if accompanied with inflammation or ulceration, these should be subdued as speedily as possible. The first case I have mentioned came to me in its advanced stage, and I could get no history of it; the family physician attributed it in a general way to an adynamic condition incident to numerous closely-succeeding pregnancies. All the cases of this lesion which I have seen were accompanied by ulitic symp-

toms. Tomes, however (p. 447, "System of Dental Surgery"), describes a case in which a number of teeth were lost from this cause, and which was unaccompanied by any indications of the presence of disease either in the gums or alveolar process.

Under the head of atrophy we may also class those other causes for the loosening of the teeth the first of which is the gradual recession of the gums and investing tissues without any other signs of disease, differing essentially from the so-called "Riggs's disease," in that there is no discharge, no adhering calculus, no sinus or pockets, and no ulitic symptoms accompanying it; the appearance of the gums is anæmic, expressing feeble vascular action. Individuals suffering from impaired digestion are said to be most liable to it; therapeutic treatment would be ill-directed in a case of this kind, and for such persons the best safeguard would be a life of exercise in the open air with plain nutritious food.

There is a somewhat similar form of alveolar absorption, confined, however, usually to the incisor teeth, which resembles in its pathological character the condition just described. It consists of a partial atrophy of the alveolus, the seat of the lesion being confined to the outer plate, which gradually recedes, thus depriving the teeth of much of their support; the result is that change of position and mal-occlusion gradually follows. From observation in a number of these cases I am disposed to regard this as hereditary, and I may mention one case which will serve as an illustration. A lady patient of middle age consulted me about the gradual spreading of the front teeth; they were perfectly sound and well developed, but they were beginning to project so much as to disfigure the patient, and from the extent to which they deviated from the perpendicular line to be entirely useless for the purpose of incising, in addition to which they were elongating and becoming loose. It was decided to extract, and replace them upon a gold plate. Shortly after this a son of the lady, aged eleven, was brought to me with about the same condition, the teeth projecting and resting in a very unsightly manner upon the lower lip. Very little difficulty was experienced in bringing these teeth to nearly a perpendicular position; a retaining fixture was adjusted, which held them in place for two years; they however eventually returned to their former position.

The conditions herein considered should not be confounded with loosening of the teeth of very aged persons. In advanced life the tissues change; the capillaries become obliterated, constituting a general senile atrophy. To this cause may be attributed that diminution of the alveolus eventuating in loss of the dental organs, and the process seems to be so nearly a physiological one that all treatment is contraindicated.

THE ELECTRO-MAGNETIC Mallet,—CONSTRUCTION, ADJUSTMENT, AND MOVEMENT OF ITS PARTS, AND MANAGEMENT OF THE BATTERY.

BY MARSHALL H. WEBB, LANCASTER, PA.

(Read before the Pennsylvania State Dental Society, July 29, 1880.)

ELECTRICITY is manifested as atmospheric, statical or frictional, voltaic or galvanic, dynamic, and magnetic. Magnetic electricity consists in the spiral circulation of electricity round a bar of metal, making soft iron temporarily magnetic.

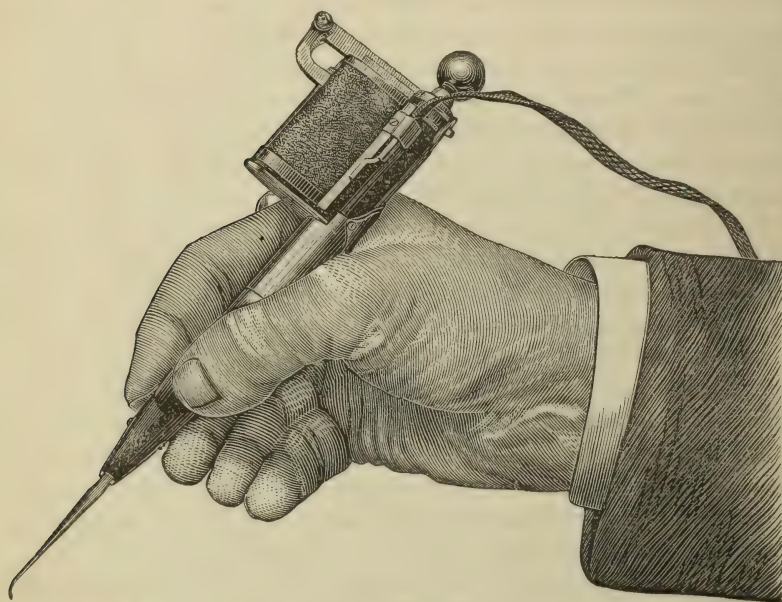
Dr. W. G. A. Bonwill conceived the idea of the electro-magnetic mallet February 27, 1867, whilst listening to the more than ordinarily distinct tapping of the "sounder" in the telegraph-office at the Continental Hotel, Philadelphia, within a square of where Franklin succeeded in his experiment and collected electricity from the clouds.

In the construction of the electro-magnetic mallet Dr. Bonwill gained some ideas from the electro-magnetic telegraph instrument, the sound of which indicated to him that some such taps, if given with greater force, might give sufficient impact to solidify gold. There was nothing new in the arrangement of a coil of wire around a bar of soft iron, which bar, upon the passage of a current of electricity through the coil, becomes a magnet, and attracts to it one end of an armature moving upon a pivot at its center, for in 1832 Morse was experimenting in this direction, and it can now be seen in every telegraph instrument. Dr. Page did not make any claim of originality for a similar device used in 1836 in his experiments in reference to magneto-electrical apparatus for "administering electricity as a remedial agent," but in order that, when the encoiled bar is demagnetized by the breaking of the current on the wire surrounding it, the armature thus released should not travel beyond reach of the attraction of the bar when the circuit is again closed and the bar again becomes a magnet, Dr. Page added a small thumb-screw, against which when set free the armature recoiled and stopped. This was claimed as a great invention only in connection with an electro-magnet. Dr. Bonwill greatly modified and improved the electro-magnet and the armature, and so arranged two magnets and the same armature as to make, and invented and constructed such parts as were necessary to complete, the electro-magnetic mallet. The name of Dr. W. G. A. Bonwill will, therefore, be as surely connected with, and is as inseparable from, the electro-magnetic mallet as is that of Prof. S. F. B. Morse with the electro-magnetic telegraph. As with this, so with the electro-magnetic mallet, modifications have been made by others as well as by its originator and founder, but such of these changes as are of value add to, rather than detract from, this

fine and wonderful piece of mechanism, and thus increase, rather than cancel, the debt of gratitude we all owe its inventor.

During the year 1878, Dr. Bonwill invented and has since used an engine, or what he styles a "mechanical mallet," instead of, and which he claims as superior to, the electro-magnetic; yet, in a letter received from him, he states that he is "not unmindful of the part" your essayist has played "in assisting to give the electro-magnetic mallet a glory second to no other invention ever given to dentistry." The real glory of the electro-magnetic mallet consists in the good it has done those who have used it successfully. Of such assistance has it been since the spring of 1873 to the writer that he feels it has already done much towards saving years of his life.*

FIG. 1.



The manner of holding the electro-magnetic mallet is here illustrated (Fig. 1), the thumb and index finger serving to steady and guide the instrument the same as a pen or pencil, and to close and open the circuit.

The electro-magnetic mallet here shown, and as now made, consists of a pair of magnets; an armature, and a device for regulating the length and movement of the same; a hard rubber hand-piece in which the packing instrument is placed and operated, the same

* That the electro-magnetic mallet be made to work well, aid in making fine fillings, and benefit the operator, is the only interest I ever had in it.—M. H. W.

resting against a hard rubber piece called a plunger, which is so adjusted by a screw as to have the end of the armature or the mallet-head drive the packing instrument only to a certain extent; then there is a very important part called the interrupter, or automatic circuit-breaker. There are other parts which will be referred to further on.

The cores of the magnets are made of the best soft iron. They are placed side by side, about one-quarter inch apart. At one end they are connected with each other by screws through an end-plate—a piece of soft iron about a half-inch long, and of the same width and thickness as the cores. Each core is made about one and a quarter inches long, three-quarters of an inch wide, and an eighth of an inch thick along the center, and is rounded down to the edge so as to make both sides slightly convex. The insulated copper wire can then be more closely placed around the iron, thus insuring more complete “saturation of the core.” A small flange should be left at the end of each core over which the armature is to rest, that the rubber end-piece may be held in place while the wire is being (and after it has been) wound around the iron. The soft iron end-plate which is screwed to, and which connects the cores, keeps the hard rubber at that end in place.

When the soft iron cores, end-plate, and armature are properly formed and smoothly finished, they must be annealed,—heated to redness and placed in hot granulated charcoal to cool gradually. All other metallic parts, except a few screws and the springs at the end of the rubber hand-piece, are made of brass.

The hard-rubber end-pieces are accurately fitted and placed upon each core, after which the soft iron end-plate is screwed to one core to secure rigidity while the copper wire is being wound. It is then detached from the first and placed upon the second core for the same purpose. When both cores are covered with the wire they are screwed together.

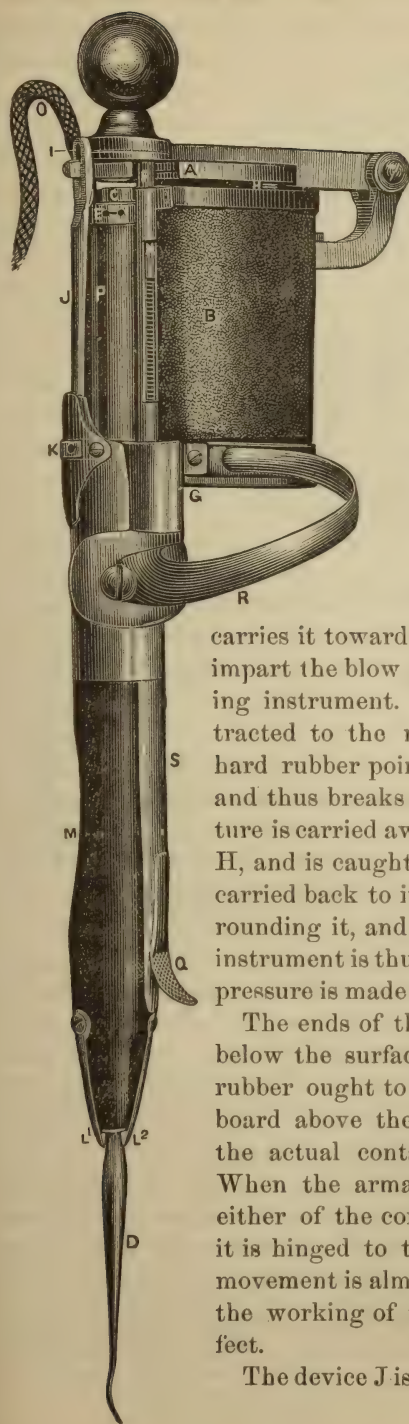
Previous to placing the end-pieces upon the core its sides ought to be entirely covered with the finest silk “court-plaster,” that the wire may be the better insulated from the iron. Copper wire No. 23 (American gauge), insulated with silk, should be very carefully and closely wrapped around the core, and after one layer is on, this and each succeeding layer had best be covered with one thickness of Japanese bibulous paper; this should be simply saturated with a solution of gum-shellac in alcohol. After five layers of wire are thus placed upon each core the magnets should be put together, the iron end-plate screwed to both cores, and one end of the wire from one magnet connected or twisted with one from the other. One of the loose ends is thereafter to be connected with the interrupter, and the other end fastened to one of the posts over which one of the

tubes of the connecting cord which connects the mallet with the battery is to be placed. It has been said that "the thickness of the helical coil should be equal to the diameter of the core," and five layers of No. 23 wire makes up this thickness—six layers more than does it—when the diameter of the core is one-eighth of an inch. The mechanism of the other parts of the electro-magnetic mallet can be understood by reference to, and by a study of the instrument as here illustrated, and particularly by paying close attention to the description of the various parts and gaining a knowledge of their adjustment and movement.*

The connection of the mallet with the battery is made by means of small metallic tubes attached to the two sets of wires of the conducting cord; each tube fitting tightly over a projecting wire or post. The index finger is placed through the ring attached to the hand-piece; the end of the finger resting upon the flange of the slide, which, when pressed downward towards the end of the packing in-

* The modifications which I made in the electro-magnetic mallet, briefly stated, are mainly as follows: In 1874 I put on the shaft or rod (J) to serve a better purpose than the device previously used to fix the stroke of the armature, and to make its movement steady, or prevent the oscillation of the instrument which attended its operation when only the rod to which the armature is attached supported it. I attached the conducting cord differently, and made the wires come in more perfect contact with the mallet through small tubes (on the reverse side of the instrument, but not seen in the cut). Principally by lessening the number of layers and the size (using No. 23, instead of No. 22, American gauge) of wire upon the cores of the magnets I made these and other parts of the mallet much smaller than the Bonwill "Improved" instrument, which I was using when I made these last changes in 1875. I made the soft iron cores a little convex on *both* sides, so that the insulated copper wire could be the more certainly and perfectly wrapped around them, and thus insure more complete "saturation" of the iron. I made no special change in the armature except to make it lighter, improve its appearance, and change the manner of hinging it to the upright which supports it. I changed the manner of preventing the turning of the rod of the interrupter, and to this rod attached the hard rubber piece differently to act as an insulating point; made the spiral spring of lighter brass wire, and in this way, and with the advantages gained by the rod, J, I was enabled to make such adjustments as to have the instrument operate more regularly and evenly, and the armature give a more distinct blow than any similar or other mallet. I fitted a spiral spring around the plunger (C) to keep it always towards the armature (A). I so fitted the spring L¹, as to more perfectly keep the packing instrument (D) against the plunger (C). Dr. I. F. Wardwell added the second spring (L²), and the two, made of steel and properly tempered and fitted, hold the packing instrument nicely in place. Among some other changes which I made in the electro-magnetic mallet (and which can be seen by comparing other instruments with the one here illustrated) I will simply mention the manner (though perhaps not the original method) of closing the points to make the circuit complete under the slide (at S).—M. H. W.

FIG. 2.



strument, brings the positive and negative poles of the battery under the slide in contact. The circuit being thus closed there instantly follows an influx of the electrical current through the helices, when the armature A, acting as a mallet, is attracted to the electro magnets B, and, at the same instant, it strikes upon the hard rubber plunger C, which is so adjusted as to have sufficient movement to impart a blow to the packing instrument D, which instrument is placed against it. The plunger is adjusted and kept in place by means of the screw E. A spiral spring fits loosely around the plunger, and, after each blow is given, immediately

carries it toward the armature to again receive and impart the blow given by the armature to the packing instrument. The instant the armature is attracted to the magnets it also strikes upon the hard rubber point F on the rod of the interrupter, and thus breaks the circuit at G. When the armature is carried away from the magnets by the spring H, and is caught at I, the rod of the interrupter is carried back to its position by the spiral spring surrounding it, and the circuit is again closed. The instrument is thus kept in operation as long as slight pressure is made upon the slide by the index finger.

The ends of the soft iron cores should be a little below the surface of the hard rubber plates,—the rubber ought to extend the thickness of fine card-board above the ends of the cores so as to prevent the actual contact of the armature with them. When the armature does not strike any part of either of the cores (and is not loosely fixed where it is hinged to the upright which supports it) its movement is almost noiseless and less unsteady, and the working of the whole instrument is more perfect.

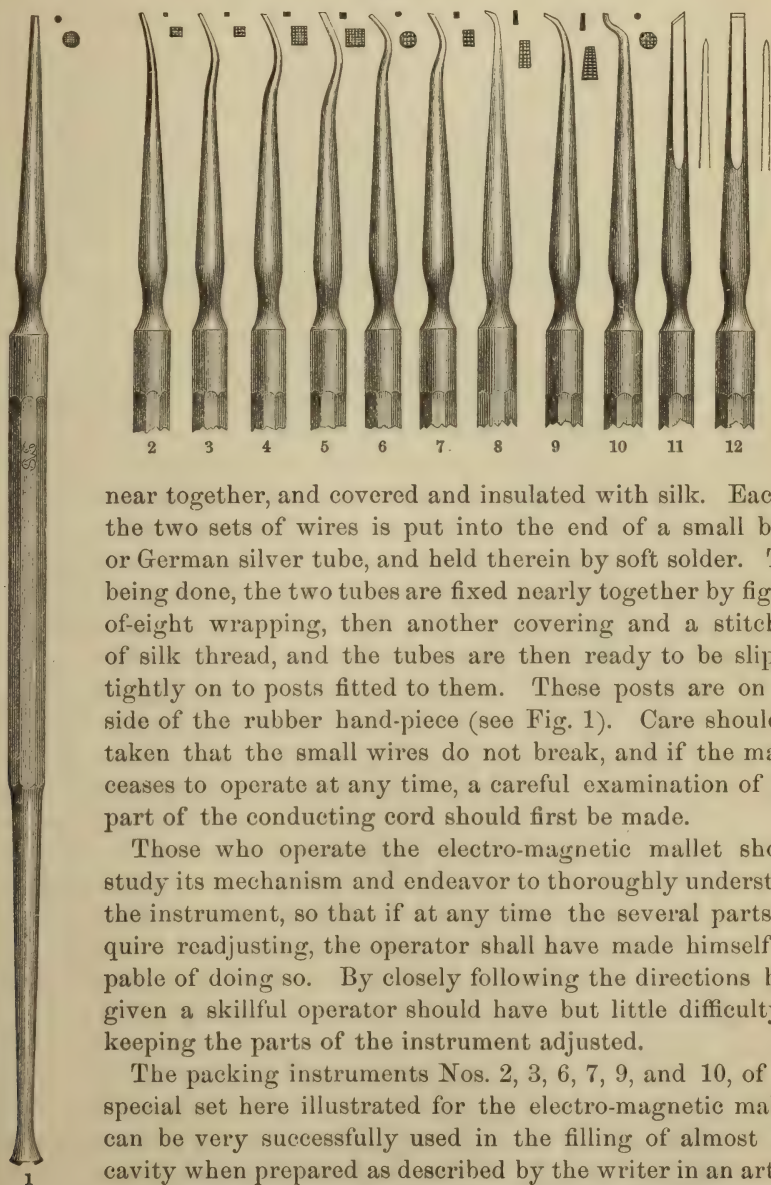
The device J is an attachment by which the stroke

of the armature is regulated and the desired force of blow secured. The armature, ordinarily, should have a play or movement of the sixteenth of an inch above the plunger, but when a little heavier than the usual blow is required without recharging two of the four cells of the battery while performing an operation, the stroke of the armature should be slightly increased by turning the nut K upon the shaft or rod J. A lighter blow can be had (so far as changing the length of the stroke of the armature aids in this) by screwing up the nut K a little, or to a certain extent. The hard rubber piece I in one end of the rod J is inserted to lessen the sound of the armature when it is thrown back from the magnets.

The packing instrument D passes up through the hard rubber hand-piece P; it is kept in position and in contact with the plunger C by means of the springs L¹, L², and is steadied, directed, and turned by the thumb through the opening M. The hard rubber plunger or adjuster C should be so regulated by means of the screw E that when the packing instrument is pressed against it the armature shall so strike the same that there will be but space sufficient through which to pass a piece of note paper between the armature (when this is pressed upon the plunger) and the rubber plates upon which it strikes. The rod of the interrupter should, at the same time, be so adjusted that the hard rubber point F just comes against the part of the armature or mallet-head which strikes upon it. This is done by raising or lowering the hard rubber part F, or the small metallic nut in which it is placed, and which screws on to the rod of the interrupter. When this part is in the proper position the small nut adjoining must be screwed tightly against it, so that the part may be firm and immovable upon the interrupter rod during the operation of the instrument. When the spiral spring surrounding the rod of the interrupter is compressed by the small nut N, it accelerates the movement of the parts and more rapid blows follow. When the pressure upon the spring is lessened by unscrewing the nut which regulates it, the armature plays more slowly; but it should be remembered that the force of the spring must be sufficient to connect the platinum points at G, and thus close the circuit when the armature is thrown back by the spring H, after having driven the rod of the interrupter forward and broken the circuit. Greater strength of the spring H, which throws the armature back from the magnets the instant the circuit is broken or interrupted at G, is more necessary when the battery is freshly charged than when the fluids become mixed and the power is thus lessened. The tension can be regulated accordingly by turning the nut underneath the spring H; however, it is rarely, if ever, necessary to do this when the force of the spring is once properly fixed.

The cord O, which conducts the current from the battery to the mallet, consists of two sets of a dozen small copper wires each, placed

FIG. 3.



near together, and covered and insulated with silk. Each of the two sets of wires is put into the end of a small brass or German silver tube, and held therein by soft solder. This being done, the two tubes are fixed nearly together by figure-of-eight wrapping, then another covering and a stitching of silk thread, and the tubes are then ready to be slipped tightly on to posts fitted to them. These posts are on the side of the rubber hand-piece (see Fig. 1). Care should be taken that the small wires do not break, and if the mallet ceases to operate at any time, a careful examination of this part of the conducting cord should first be made.

Those who operate the electro-magnetic mallet should study its mechanism and endeavor to thoroughly understand the instrument, so that if at any time the several parts require readjusting, the operator shall have made himself capable of doing so. By closely following the directions here given a skillful operator should have but little difficulty in keeping the parts of the instrument adjusted.

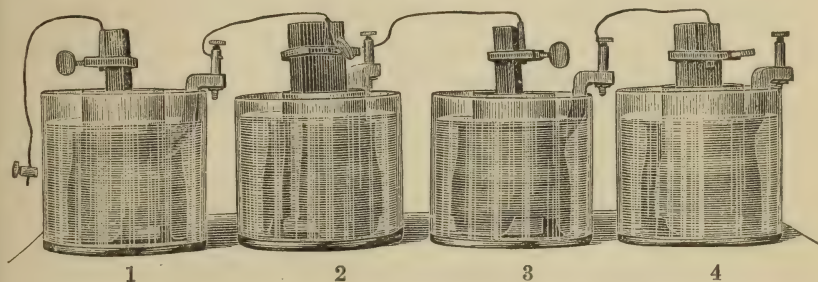
The packing instruments Nos. 2, 3, 6, 7, 9, and 10, of the special set here illustrated for the electro-magnetic mallet, can be very successfully used in the filling of almost any cavity when prepared as described by the writer in an article on "Operative Dentistry" published in the *DENTAL COSMOS* for September, 1879.

As each piece of folded or plain (No. 30 or 60) foil is passed over the

flame of alcohol and introduced into the cavity (either by an assistant with light-pointed foil-carriers, or by the operator himself with the packing instrument) and simply attached to the part (one or two pieces) placed by hand in the starting-point, or that already there, the electro-magnetic mallet should be set in operation, and the finely-serrated point of the packing instrument placed (*not pressed*) against or patted upon the gold in a manner similar to that of making dots on paper with a pencil. Light, hard, or graduated blows can be made without changing the adjustments of the instrument, as fine or heavy lines are made on paper with a pen. When the electro-magnetic mallet is operated and guided as here indicated, gold can be carried against and over the margins (even frail edges) of enamel without fracturing them, and without the instrument passing off and puncturing the rubber dam and wounding tissue. Almost the same blow is required throughout each and every operation, because the gold should be solid and uniform in density; hence the action of the battery ought always to be regular, so far as intensity and constancy are concerned, and the pieces of gold for a given operation ought to be about the same in size and be cohesive, as well as uniformly and solidly impacted. By a simple touch the gold (which should always be cohesive) adheres to that placed in the starting-point; a slight movement of the slide Q by the index finger (placed through the ring R) closes the circuit at S under the slide; and the armature A is attracted to the magnets B and imparts a blow to the packing instrument D through the hard rubber plunger C, and, at the same instant, touches upon the part F, which temporarily interrupts or cuts off the current at G. This successively and rapidly occurring with a full current of electricity in a properly-adjusted electro-magnetic mallet, an operator can, by carefully and intelligently guiding the instrument, go over the whole surface of foil much better, and the gold can be made more solid and uniform in density with greater ease and rapidity than by any other known method. This is true of the electro-magnetic mallet, because to expel the air from between, and to place the particles of foil in absolute contact in every given piece or body of gold, or, in other words, to place all the cohesive particles within the "sphere of influence" of each other, a certain number of blows of given force is necessary; and to thus go over the whole of each piece being impacted by any other known method would require the expenditure of more time and greater effort. That gold be perfectly impacted it is not so necessary that a really heavy blow simply be struck as it is that rapid, regular, and only moderately heavy blows be skillfully given upon each piece of foil. With no other force thus far manifested can this be done so well as with electricity.

The operator ought to keep the battery in good condition and attend to it himself, unless he has some one who is very careful and faithful, and who appreciates its importance fully enough to attend to it for him.

FIG. 4.



The improved Bunsen cell, with a large carbon, should be used for the electro-magnetic mallet. Four cells are required, and new zincs must be amalgamated before the battery is charged. To do this place one of the zincs in a glass jar and fill in the water till it is on a level with the top of the round portion of the zinc, then lift the zinc out of the water and pour into this three and a half fluidounces of sulphuric acid. Replace the zinc and keep it in the solution a half-hour, or a little longer, or until the zinc is so acted upon by the acid as to take up the mercury then to be dropped upon the whole surface. Do this with each of the zincs, then pour away the solution used, and charge the four cells; thereafter two of the cells ought to be recharged each week alternately.

The whole battery should be kept clean, and the zincs must be well amalgamated; mercury should be added to new zincs each day for the first two or three weeks, and to keep them bright, a little mercury ought to be placed upon each one almost every time the battery is recharged.

The *electropoion fluid*—the solution for the porous cups—is made in a large, strong, glass or porcelain-lined vessel, by dissolving a half-pound of the bichromate of potash in a half-gallon of hot water, and then adding ten fluidounces of chemically pure sulphuric acid.

In charging the battery, sufficient of the bichromate solution should be put into each porous cup (after the carbon is placed in it) to come within about an inch of the top. Each zinc should be placed in a glass jar, and the porous cups containing the carbon and solution be put in position (as above illustrated). Put in enough water to fill each glass jar to within about an eighth of an inch of the top of the cylindrical portion of the zinc, then remove the porous cup (with the carbon) and the zinc, and slowly pour one and a half fluid-

ounces of chemically pure or two ounces of the ordinary commercial sulphuric acid into the water in the jar; after which replace the zinc and porous cup. In place of this a solution, consisting of nine parts of water to one of sulphuric acid, may be poured into the glass jar to just cover the zinc. The solutions should be on a level, one with the other. Care must be taken that not even a drop of the solution in the porous cup be allowed to get into that outside of it. Proceed thus with the four cells, and connect them (carbon to zinc). Connect the conducting cord to the mallet, and the other end of this cord (or additional conducting wires if they be required) to the zinc of the first cell and the carbon of the fourth or last. The parts where the zinc of one cell is connected with the carbon of the next, etc., and those where the wires connect with the mallet, should be bright and tight; with all this properly done, the battery is always in readiness.

CLINICAL REPORTS.

PHILADELPHIA DENTAL COLLEGE—HOSPITAL OF ORAL SURGERY.

NOTES ON CLINICAL SERVICE OF PROF. J. E. GARRETSON, M.D.

REPORTED BY WILLIAM C. FOULKS.

CASE I.—TUMOR ON THE CHEEK, HAVING THE EXPRESSION OF AN ALVEOLO-DENTAL ABSCESS. Gentlemen,—You who were here during the spring course will remember this little boy. The disease for which he was treated—for which, indeed, he still requires treatment,—is a parasitic condition which, for lack of a better appreciation, I denominate *syccosis parasitica*. Hebra, in his "Diseases of the Skin," doubts if there be such a disease, and cites Barenprung, G. Simon, Wedl, and others, as holding the same views. Without discussing the question from our standpoint as oral surgeons, we may at any rate define the condition before us as a tumor having the expression of an alveolar dental abscess, apparently about to point and discharge through the cheek. Never judge by appearance alone, gentlemen, if it be possible to obtain other data. In an extended practice of some thirty years, I have never seen more than eight cases of this disease. I had the pleasure to show at my clinics of last year some four or five, half of all I have ever met. I will give you a general description of it: The disease is evidently of fungous origin. It is to be distinguished by absence of lesion outside of the condition itself, by the peculiar appearance of the hair-bulbs, and by the stroma of the tumefaction, the contents being a cellular mass with a bloody exudate. The condition makes its appearance after this manner: first, the parts swell

and little by little assume the expression of developing abscess. As the condition occurs about the sides of the face, its resemblance to an alveolar abscess pointing externally is, indeed, most marked. I have known the disease to be so diagnosed and treated. Careful investigation, however, discovers no lesion outside of the thing itself. To-day I want you all to study and endeavor to understand this case, so that, *whenever or wherever you again* meet with the lesion, you may be able to appreciate its significance. As dentists, it becomes you to *know* of it as *distinguished* from alveolar abscess. In the case of this little boy the disease has a characteristic appearance,—that is to say, looks very much like a half almond in form, and of a decided purple color.

Fluctuation, sometimes very apparent (not so here, because nearly well), is only expressive of degeneration. This, you will understand, is to be accepted as a diagnostic sign of an abscess pointing externally; so, too, of its position, might I say; so, too, of its appearance. Not so, however, as relation is had to pain or systemic and nervous complications. On this little boy the disease, as you see, is located upon the left side of the face, just in front of the ear; you may remember that I cut into the swelling and found a bloody mass. The stroma of the tumor was red, not yellow. Looking at the tumefaction here, you may see the hairs growing from its surface; pull one out and you have the origin of the disease, a fungoid parasitic growth embracing and encircling the body of the bulb. Finding this condition, you have the diagnosis. Whether this fungus is parasitic from an animal or vegetable standpoint I have not decided; that it is fungoid, I am assured. Just how the intruder may have found lodgment in this particular spot,—whether by the blood, through the epiderm, or in other way,—I do not know. For our clinical purpose to-day we understand sufficient in recognizing the condition to be parasitic. The question now resolves itself into how shall we destroy the parasite? In my study and treatment of the disease I have been so fortunate as to discover two (with me) successful applications. First, I found that créasote cured two or three cases, so I called it a specific. Second, corrosive sublimate—two grains to the ounce of water—painted over the part affected, did the same thing. With the use of one or both, I have been enabled successfully to combat the disease. In some cases it yields slowly; but with proper attention and a comprehension of the cause and nature, together with an appreciation of any adverse constitutional indications,—scrofulous, venereal, or other,—the cure becomes simply a matter of *time* and *patience*.

In an unwillingness to accept that this disease is exactly the sycosis of the dermatological definition, I assume familiarity on the part of the members of the class with the condition so named, the “Felg-

wazen" of our German writers,—a lesion arising out of the presence of the microsporon mentagrophytes. The disease before us I have shown you in two cases on the hairless faces of women. Herpes pustulense is a lesion confining itself markedly, and according to many dermatologists exclusively, to the chins and cheeks of bearded males.

CASE II.—Young lady (private patient of Prof. Garretson). Trouble, hypertrophy or chronic enlargement of the tonsils. Operation, removal of the glands by cauterization with London paste. Prof. Garretson spoke of the case after the following manner:

"Gentlemen,—This lady suffers from hypertrophy of the tonsil glands. She has applied to me for relief. I propose to afford it to her by an operation upon the tonsils, which she kindly permits me to perform before you. These glands are situated on either side of the fauces, and are plainly to be seen by depressing the tongue. Here I show you an instrument used for such purpose, the use of which gives little inconvenience to the patient, and at the same time enables the operator to obtain full view of the glands. It is a singular fact that when undue force is exerted to depress the tongue it resists, and crowds itself upwards and backwards or forwards against the roof of the mouth; therefore proceed quietly and firmly. Virchow describes these glands as being the analogue of the lymphatics. Anatomically, they are made up of a collection of muciparous follicles, or crypts, held in position by connecting tissue, which crypts communicate with the throat by small ducts, through which is discharged a mucous fluid secreted by the glands. Branches from the facial and ascending pharyngeal arteries supply these glands, and their veins terminate in the pharyngeal plexus, their nerves being derived from the glosso-pharyngeal and fifth pair. In what *manner* does this young girl suffer from the *enlargement* of these glands? I answer, by reason of interference with functional duties,—that is to say, by the increased dimensions of these bodies from perverted circulation, respiration may be rendered so difficult and painful as to nearly or quite suffocate. Rest, because of such interference with function, would necessarily be difficult to obtain. Deglutition may be attended by such acute suffering as to cause the afflicted person to abstain for a time from taking nourishment. Speech is interfered with; hearing also, through involvement of the Eustachian tube, the inflammation in the glands, extending through continuity of structure to the tube, conjoined with mechanical pressure exerted by the enlarged tonsils, nearly or quite occluding the Eustachian passage. Finally, the general derangement of the nervous system from such complications is shown by the expression of the face, the actions, etc., of the patient. Here, then, we perceive the conditions, one or all of which might

exist as resultants from the primary trouble, enlarged glands. Tonsillar hypertrophy, then, being a systemic rather than a strictly local disease, little benefit will be derived from direct remedies *alone*, but, from these, together with systemic and hygienic treatment, such as salt-water bathing, diet, clothing, exercise, etc., the greatest good results. Of local measures I shall choose cauterization with London paste,—composed of equal parts of caustic soda and quicklime mixed to a proper consistency with water or alcohol. It would be very easy for me to use the tonsillitome, or the bistoury, but the *knife* should be in the most experienced and skillful hand. I now mix the paste, taking care to have no lumps in it. Allowing the light to fall directly upon my patient, I standing to the right of and behind her, I flex the head slightly backwards, depress the tongue, and, carrying the paste on the end of this director, apply it to the gland, holding it there until the patient can stand it no longer. I repeat the application. Notice the rapid action of the cauterant: the membrane, when first touched by it, instantly turns of a deep flesh-color; next a dark, blackish spot appears, streaked with blood. To-morrow this will be a whitish-looking eschar. It will slough off, and then I shall repeat the operation. I am careful, gentlemen, not to drop any of the paste, or allow it to come in contact with other parts. She gargles her throat after each application. Thus have I secured the local and efficient action of the cauterant. I not only gain by the loss of a portion of the glands in sloughing, but also some by their general contraction.

“Had I time, I would describe to you a similar operation I performed for a patient brought to me from Wilmington, Del., who was in an almost strangulated condition, in which operation I succeeded most happily. I would advise you all to read that portion of your work on oral surgery devoted to a consideration of the tonsil glands.”

CASE III.—Gentleman of forty-five, suffering from facial neuralgia; cause, carcinoma. Questioning the patient, it was found that the pain had existed some three or four months. He thought at first that he had odontalgia in a right inferior cuspid, so went to a dentist and had the tooth extracted. The pain then located in the superior maxillary, about the position of the right superior cuspid, which tooth had been extracted some twenty years before, and in the removal of which he supposed the alveolus had been fractured. He complained also of failing health and a sense of constant soreness about his mouth and gums, extending as far back as the fauces. Peculiar lancinating pains in the face annoyed him very much. Prof. Garretson examined his mouth after eliciting these facts, and said, “Gentlemen,—now an aphorism: Unless you know what *to* do, do nothing. I cannot repeat this too often; it is the highest practice of

medicine and surgery. Several gentlemen have diagnosed this case, and pronounced it neuralgia. What is *that*? Nerve pain. Yes, simply that and nothing more. They only gave the distinctive name of a pain, without expressing or suggesting anything as to the possible cause. The gentleman, however, who *sent* the patient here recognized that *something* was wrong about this man's mouth. The patient, then, has neuralgia. I ask you, What is the cause of it? I think I may say, out of experience, that he has carcinoma, and *it* is the cause. Do I know? you ask. I answer, I do not; and yet, knowing what I do, I shall not attempt to do anything *directly*, at present. When I look at the expression of the patient's face, I can only liken it to a cold buckwheat cake. His general appearance is indicative of carcinoma,—tired, worn, and anxious. I examine his mouth. The superior jaw is edentulous, but extending from about the position of the *left* cuspid tooth as a center, involving the maxilla and overlying gum, I notice a dark indurated swelling and thickening of the parts. I must decide on one of three conditions,—carcinoma, necrosis, or caries. Gently inserting this silver probe, I feel for soft bone. . . . I cannot find any, but the feeling is as if the bone had turned to fleshy hillocks. Again I ask you, What am I to do? Let it alone! Yes; I will follow your advice, gentlemen, and advise the patient not to let any one probe or irritate his mouth. The removal of two nearly exfoliated teeth, which you see here in the lower jaw, is plainly indicated, as they are a source of constant and increasing irritation, from occlusion, to the diseased portions of the upper maxilla, against which the teeth strike. You will say, How do you know that *new centers* of disease will not be formed in the *sockets* of the teeth if they are removed? I will answer, That I cannot tell; it may so happen, and it may not. I know, however, that I will relieve this man from the continual goading and irritation which he now experiences from the presence of these teeth. I will prescribe an alterative wash,—one-half ounce of phénol sodique to eight ounces of water,—to be used two or three times per week. I think, gentlemen, you will agree that we can do nothing more for this man at present. He may come back to us in two or three weeks and report.

[Dr. Garretson made the statement to the class that funds are now in hand for the support of a certain number of free beds to be occupied in rotation by patients requiring operations. Application to be made to the surgeon in charge.]

PROCEEDINGS OF DENTAL SOCIETIES.

AMERICAN DENTAL ASSOCIATION—TWENTIETH ANNUAL
SESSION.SECOND DAY.—*Evening Session.*

THE association was called to order at 8.45 P.M., President Shepard in the chair.

A committee, consisting of Drs. Atkinson, Peirce, Taft, Morgan, and Mills, was appointed to report resolutions upon the death of Dr. Samuel S. White.

The consideration of the report of Section Fourth, Operative Dentistry, was resumed.

Dr. Allport was pleased with Dr. Tucker's remarks on filling with soft gold. Most of the members of the association know his (Dr. Allport's) opinion on the matter, and how he has long been opposed to the exclusive use of cohesive gold. Cohesive gold has its place, but that place is not for the filling of cavities. Of course, good fillings can be made with cohesive gold, but soft or non-cohesive foil, on account of its greater pliability when its surfaces at distant points are brought together, can be adjusted to the walls of the cavity with greater ease, and is therefore more certain of success in the hands of the average operator.

Cohesive gold should be used for finishing fillings, as it affords a more durable surface; and also for contour work, or restoring the shape of the tooth. But the filling of a cavity is an entirely different operation, and requires a different quality in the material used. The chief requisite in arresting decay in a tooth is to exclude moisture. A saving filling, therefore, must prevent the ingress of moisture as a perfectly-fitting cork in a bottle prevents the egress of fluids. A glass stopper *may* be so exactly fitted as to produce this result, but the great amount of time and skill required to do it renders it impracticable for general use. Great care in fitting insures success, but the slightest deviation from exactness renders it comparatively useless, without regard to the hardness of the cork. Hence the ease with which the ordinary wood cork can be adapted to its various requirements renders it more practicable for general use. Cohesive gold for fillings is like the glass stopper. When manipulated with extraordinary skill, it may be successfully used, but it is not advisable in the hands of the average dentist. The gold to be recommended for general use is not that which only the highest skill can perfectly utilize, but that which the *average* skill can use with the greatest efficiency. If cavities in teeth presented regular surfaces there would be less objection to the use of cohesive gold; but the

irregularities generally met with in cavities require a filling material of the greatest flexibility, in order to secure perfect adjustment. Non-cohesive foil more exactly answers this requirement than does cohesive gold. The difference between these two qualities is that when two pieces of non-cohesive gold foil are brought together, the surfaces will slide upon each other without uniting, while two pieces of cohesive gold, when brought into contact, will immediately weld by cohesion. When this cohesion is produced by pressure, as by a blow from the mallet, the gold becomes hard, unyielding, and difficult to manipulate. A piece of cohesive gold foil rolled between the fingers will cohere at various points, and shortly becomes hard and angular, refusing to be compressed into its smallest possible dimensions without great force. Non-cohesive gold foil, subjected to the same treatment, will constantly diminish in size without this angularity, only becoming hard as it becomes solid. Cohesive gold foil may be rendered very hard and unyielding, while at the same time the microscope shows it to be full of holes. In this condition every blow from the mallet on the filling near its margin tends to tilt the edge and draw it away from the walls of the cavity. The space thus produced may be but microscopical at first, but it is quite sufficient for the admission of external agents, the forerunners of decay and of the ultimate destruction of the tooth.

The readiness with which the surfaces of non-cohesive gold foil slide upon each other renders it far less liable than is cohesive gold to choke or clog when being forced into and fitted to the fissures and sharp angles of the cavity most liable to leak and produce decay.

It is true that the surfaces of the non-cohesive gold fillings put in by our skilled operators of fifteen or twenty years ago do not look as well as those made with cohesive gold at the present time, but in a majority of ordinary cases the fillings put in at that time by these operators saved more teeth than the average college graduates of to-day are saving with highly cohesive gold.

We frequently find fillings, put in by these old-fashioned operators, with ropes of non-cohesive gold, so soft that they can be readily penetrated with a plugger or lifted out with an excavator, easily uncoiling after removal; yet these fillings were preserving the teeth, the only reason for removing them being loss of surface by friction.

No material ever used for filling teeth is more deceptive than cohesive gold. Its liability to draw from the tooth and ball up under direct pressure from the instrument renders it necessary for most operators to make retaining-points at different places, in order to keep it from tilting, which is caused by a lack of perfect adaptation to the walls of the cavity. Whenever this occurs, no matter how many retaining-points may be made, moisture will penetrate between the filling

and the tooth. That this condition is of frequent occurrence is evident from the fact that we so often see teeth presenting a suspicious color soon after having been filled. Later on they turn blue, indicating the presence of decay; and the filling is therefore useless, no matter how hard its structure or how highly polished its surface may be.

Dr. Morgan would like Dr. Allport to give his ideal of a perfect filling.

Dr. Allport explained that by a perfect filling he means a filling that will preserve the tooth the longest. The essential thing is that the gold shall absolutely fit the walls of the cavity. The least opening between the walls and the filling will be fatal.

Dr. Barker. Would you use soft gold where you haven't four good walls? Do you use cylinders?

Dr. Allport. I use soft gold everywhere so far as filling cavities is concerned.

I formerly used cylinders if the cavity to be filled was cylindrical in shape, but of late years I don't use them much. There is no objection to their use in such cases. I use ordinarily pellets rolled up unevenly. I formerly used cylinders, but latterly I think I can do better with the pellets.

Dr. Morgan desired to enter his protest against Dr. Allport's assumption. Dr. Allport is frank enough to confess his inability to fill a cavity with cohesive gold, and he therefore assumes that others cannot. He (Dr. Morgan) uses soft gold, but he can use and does use cohesive. When he sees a blue tooth which has been filled with cohesive gold, he believes it is the fault of the manipulation, not of the material used. His ideal of a perfect filling is one for which the cavity is so shaped that it will retain the gold when packed. No decay must be left in the cavity, but all diseased dentine must be removed, and the gold must be so packed that it shall perfectly fill the cavity, and the gold itself, when packed, must be perfectly solid. If the filling is soft enough to allow an excavator to be put through it to the bottom it is imperfect, and while some such fillings may preserve the teeth into which they are packed, the majority will drop out. Dr. Allport's assumption that the majority of the fillings put in forty or fifty years ago preserved the teeth better than those now made cannot be demonstrated. (Applause.) It is a fact that from one-fifth to one-fourth of the teeth which are now preserved with cohesive gold are such that even the best of operators thirty years ago would not have attempted their preservation, but would have condemned them to the forceps.

Dr. Thos. Fillebrown, Portland, Me., wished also to enter his protest against the assumption that soft gold is superior to cohesive. It

is not necessary to use the mallet in packing cohesive gold. He knows of more than one operator who does not use the mallet in one-twentieth of the fillings they put in. Cohesive gold can be packed by hand-pressure as well as soft, and with less risk of injury to the tooth, because it doesn't take so many pounds of pressure to get the cohesive into place. There is no need of retaining-pits. The first piece of cohesive gold put into the cavity can be held in position while the next is being adjusted so that it will hold itself, just as readily as soft gold. It can be used with hand-pressure with from three to five pounds pressure, while the soft gold requires from twelve to twenty pounds. When cohesive gold is used in that way you have the most plastic form in which you can get gold, and you can carry it home to its place as readily as Fletcher's enamel can be carried home, and you have fillings that do not get blue at the edges. He has seen cohesive fillings twelve or fifteen years old that preserve the teeth as perfectly as any of the soft gold fillings put in thirty or forty years ago did.

Dr. G. R. Thomas, Detroit. No two dentists operate alike. No two physicians treat a case alike; if they do it is a coincidence. There are so many things in which we differ, that it is folly for one to protest against another man's method. He is not a strictly non-cohesive gold man. He came into the profession eighteen years ago. Men before him had used almost exclusively gold of No. 20, and as high as No. 240, but they don't do it now. When cohesive gold was first introduced to the profession men went wild over it, as they have done over so many things since. There is a middle ground as to the practice of filling with gold; the longer he is in the profession the less inclined he becomes to dogmatize as to which is the best way to fill teeth. (Applause.) He frequently sees fillings, forty years old, that are preserving the teeth as well as could be desired, made of *strictly* non-cohesive gold; and some of them are, as Dr. Allport said, so soft that you can run an excavator through them clear to the bottom. But at that time the operator did not attack the teeth that we now do; if there was any doubt as to the filling's preserving the tooth, the tooth was extracted. He (Dr. Thomas) was taught that retaining-pits were necessary to hold the filling in place. But he now regards it as a very poor filling that must rely upon its retaining-pits for security. There is a difference between making a beautiful filling and a useful one. A filling may be very beautiful but not useful. But if made carefully with proper material (usually non-cohesive gold within the walls, and cohesive finish) it may be both useful and beautiful. He thought Dr. Allport made a good point as to the hardness of cohesive gold; it is very deceptive. The young men should be taught to use non-cohesive gold before they use cohe-

sive; if not, they get to using larger and larger pellets, and the fillings become more and more porous. Cohesive gold, under pressure, will draw away from the walls of the cavity and will "ball" or bur up towards the center. In many cavities the approximal walls are so thin that there is danger of breaking them with undue force. Checks in the enamel are *often* produced by the mallet in keeping the filling to the walls.

Dr. J. Taft, Cincinnati, wished we could divest ourselves of special pleading. There is a great diversity of opinion in reference to methods. It is surprising to hear that cohesive gold cannot be adapted to the walls of a cavity; cohesive gold can be and is as perfectly and as easily adapted as non-cohesive. (Applause.) He had known of the use of No. 240 in experiments, but only as experiments. Some operators used Nos. 20, 40, and 60 in places where soft gold could not be used. He will put the work of some of these men against any soft gold fillings. For every case of an easily perforated soft gold filling that has stood for many years he will find decayed teeth which never were filled in which the decay has not increased for years. Cohesive gold can be packed as perfectly as non-cohesive. Those operators who cannot prevent the gold "balling" or drawing away from the walls either have defective instruments or they don't know how to use them. Any operator of ordinary ability, with proper tools, can join the gold firmly to the walls of the cavity. Why should we not use retaining-pits? Is there any objection to them? There certainly is an advantage in that when they are used the left hand is free. He can see no objection to a retaining-pit; but thinks it a good thing. The ordinary method of holding the gold until the cavity is half filled is fallacious. The gold ought to remain where it is first put, and not be moved and then replaced, because it is almost impossible to restore it to the same position it previously occupied; if it moves and is not put back exactly, the filling will be defective. The easiest method is to have your foundation laid firmly and build from the bottom upward, firmly all the time. He wanted to correct a misapprehension that might arise from Dr. Fillebrown's remarks. That gentleman had forgotten to say that a larger amount of soft gold is placed under the instrument at a time than of cohesive gold. Dr. Taft believed that with equal amounts of cohesive and non-cohesive gold under the instrument the amount of force or pressure required in each case would be about the same. He did not understand what Dr. Thomas meant by the gold "burring up," and does not believe he gets that result when he has good gold. Has seen it so harsh and hard that it was difficult to manipulate; such a result as Dr. Thomas described might occur with this kind of gold. A gold filling should be so put in that each layer will go to its place perfectly.

He has seen these cases, as many as one or two a year, of teeth that have been preserved for thirty or forty years with fillings through which an excavator can be pushed, but he objects to the inference that the faulty fillings have preserved them.

Dr. Thomas, by consent, made an explanation of what he meant by a "burred" filling. Take a piece of cohesive gold foil and roll it in the hand. The more you roll it the greater number of little prominences will appear on its surface, and the more you try to separate and straighten it out the more you can't. Non-cohesive gold does not act so. The crystals do not cohere. He believed the danger from a cohesive gold filling was as stated by Dr. Tucker, in failing to thoroughly seal up the ends of the tubuli, and not from moisture from the outside.

Dr. Atkinson. The only legitimate use of the time of the association is made by saying something useful which has not been iterated over and over again before it. It has been said that all diseased dentine should be removed from a cavity before filling. He contended that this should never be done when it will expose or nearly expose a pulp. The best way to teach the young men is by letting them stand over us and see our best efforts, from the beginning to the end of the operation, and not by sending them to get a degree, the meaning of which they do not know. The material used has much less to do with the success of an operation than a knowledge of the principles involved and the possession of manipulative skill. Many preparations for filling cavities have done well when new, but have failed in the hands of others because of a lack of knowledge of the chemical principles involved. It has been said that almost anybody can make a filling moisture-tight on its margin; almost nobody does. If the cavity is properly prepared you will have no difficulty.

In regard to transplantation there is a wide-spread misapprehension, because of the lack of knowledge of the molecular changes involved. He has seen teeth that you could tell at twenty feet were not where they belonged, and with a fistule discharging, presented as successes.

Adjourned.

THIRD DAY.—*Morning Session.*

The association was called to order at 9.30 A.M., President Shepard in the chair.

On motion of Dr. C. J. Essig, of Philadelphia, the thanks of the association were tendered to the dentists and dealers in dental materials of Boston for their courtesy in providing the drive through the suburbs of the city the previous afternoon.

The consideration of the report of Section Fourth, Operative Dentistry, was resumed.

Dr. G. J. Friedrichs, New Orleans. To gold and its proper manipulation has been given all the credit of preserving the teeth, leaving out of the account the important function of the vital forces of nature. When caries commences in a tooth calcification of the tubuli occurs, which affords a better protection than filling can,—in many cases arresting the progress of decay. The question arises in the cases of fillings through which an excavator could be run and which could be picked out without much effort, but which had apparently stood a test of forty years, whether the vital forces have not assisted in the arrest of decay. It is his opinion that they had a share in it. He had supposed the gold question settled satisfactorily,—that little depended upon the kind of gold used, but much on the man who manipulated it, since we daily see fillings of crystal gold, of cohesive gold, and of non-cohesive gold, all preserving the teeth equally well.

Dr. Benjamin Lord, New York. That is the thing in a nutshell. It is not the kind of gold used, but the power behind it. None question that teeth can be filled with cohesive gold and be preserved. None question that teeth were filled with soft gold long before cohesive gold was used at all, and were well preserved. It must follow that it is not so much any inherent quality in either which gives the service required, but the handling,—the manipulation. The great and important question is, Which can be used to the best advantage, with the greatest simplicity and certainty, by the greatest number of operators? He believes that soft gold is to be preferred in all simple cavities,—cavities which have four good walls, and often in cavities of only three walls. If he desired to make a contour filling,—a filling extending beyond the margins,—he should use cohesive gold, either in whole or in conjunction with soft, as the necessities of the case might require. But he has no question that for general use, soft or non-cohesive gold has the preference. It has greater plasticity, or rather its plasticity is maintained while it is being manipulated. Cohesive gold, on the contrary, becomes hard as it is being placed in the cavity. Yet good operations are made with it by a few, but he thinks the great majority of operators cannot use it as successfully as the soft gold.

Dr. C. S. Stockton, Newark, N. J., thought that a young man who came here to learn how to fill a tooth would go home without knowing how any better than when he came. One gentleman, educated to use soft foil, cannot use cohesive; another uses cohesive, but cannot use soft. A dentist ought to know how to use both. In some cases he should use soft gold; in others, cohesive. Both have their separate uses, and both can be used successfully in the same cavity. The two varieties of gold can be united successfully. Some of the best operations he has ever seen have been cases where the cavity has been

filled with soft gold and the filling capped or finished with cohesive. In a case where the cohesive alone failed, a filling of soft and cohesive afterwards well preserved the tooth. You can send soft gold home to the walls in one-third of the time required to properly adjust a filling of cohesive to the walls. Fault is often found by dentists with the prices they receive for their work. They are themselves partly to blame if prices are not satisfactory. If dentists would sustain one another, there would be less fault found. They are charged with the knowledge, and consequently the duty, to preserve these human organs, and should conscientiously work upon the principle of moral responsibility. They should do all in their power to preserve the natural teeth, with whatever material or by whatever method they can do the best in each individual case.

Dr. C. D. Cook, Brooklyn. We hear gentlemen say a great deal about saving teeth; that some forms of gold will save, under proper manipulation, and other forms will not. In what way do fillings fail, by leaking or by new decay starting around the border of the fillings? As beautiful fillings as I have had the pleasure of seeing, I have found undermined by new decay. It was not the fault of the operator; it was the fault of the patient in not keeping the spaces cleansed. Where decay once has been it is likely to come again, unless we make some provision for preventing its return, no matter how carefully the operation may have been performed. All this has not been explained, so far as I remember. The general fact is stated, and that everybody admits, so far as I know.

One word with respect to the matter of discussing fees in dental associations. As far as I am aware, it is not a subject of discussion in medical societies. I am not aware that artists in their meetings are in the habit of discussing what price they get for their pictures. If one can do a thing properly, he generally has sufficiently appreciative admirers with purses deep enough to get that which he deserves. I think it is not a proper subject for discussion here.

Dr. Allport asked leave to make a correction. Several gentlemen have assumed that he said what he did not say. He had said that cohesive gold could be used successfully, but not by the majority of the members of the profession.

Dr. Marshall H. Webb, Lancaster, Pa. The success of an operation depends more on the skill of the operator than on the material used or the means employed. In deep-seated cavities of decay, or in those cases where the pulp is nearly or quite exposed, some discolored dentine should be left for the protection of this tissue, and in all these cases carbolic acid ought to be placed in the cavity to disinfect the carious dentine and coagulate the protoplasm weeping from the fibers of living matter in the exposed dentinal canaliculi. After this has

been done, oxychloride of zinc should be placed in the cavity to act as a non-conductor of thermal currents, after the gold filling has been inserted. Not only should oxychloride of zinc be used for that purpose, but quite a portion of each large cavity in the crown of a molar had best be filled in that way. It is far better to do this than to endeavor so to place cylinders and pellets as to get close contact with the walls of the cavity. After filling such a cavity up to near the inner surface or first layer of the prisms of the enamel, or, in other words, covering the whole or nearly all the dentine with oxychloride of zinc, enough of this preparation should be so cut away after it has hardened to get proper and sufficient anchorage for the gold. I am speaking now more particularly of crown cavities. A starting-point should then be made, if one of the fissures will not serve the same purpose. I do not approve the practice of making so-called retaining-points to hold the filling in place, but a point to start the filling in ought to be made, in all cases, so that as the pieces of gold are put in position they may remain just where they are placed. Not a single piece of gold should move. If movement of gold takes place after it is put in position, whether that gold be the so-called soft foil or any other kind, the operation cannot but be imperfect in some degree. It has been stated that fillings can be inserted in less time and with less effort with soft foil than with cohesive gold. That is not the case if cohesive foil be properly used. If large cylinders be used, there is no question but that those of so-called soft foil can be pressed against the walls of the cavity more perfectly than the same cylinders of cohesive foil, but that is not the way to use any gold. Those who speak of soft foil do not say whether they mean absolutely non-cohesive gold or foil that becomes cohesive by annealing. All pure gold is cohesive, and difference in purity makes difference in degree of cohesiveness. If gold is non-cohesive, there is something on its surface to make it so. Such gold should not be used, even in the sulci and fissures of bicuspids and molars. There ought to be cohesion between the particles of gold, so that there may be no scaling off as the patient advances in age and the grinding surfaces of the teeth become abraded. Heavy foil, especially Nos. 30 and 60, is being and can be used with entire success; but neither it nor any other preparation of gold should be touched with the fingers, or be brought in contact with moisture in any way. The teeth that were filled with soft foil thirty or forty years ago, and still remain in place, have become more dense in structure; and most such teeth would not have been lost even had such cavities as were in them not been filled. Many operations are performed to-day that were not attempted at that time; and if we examine the fillings that were carefully inserted then, and could see the operations that are properly performed now

in similar cases thirty or forty years from this time, we should find that such fillings are more perfect than those operations performed twenty or more years ago. Cavities within the buccal or labial surfaces should be filled in about the same manner as those in the sulci and fissures, but when the approximal surfaces are disintegrated, and particularly where parts of the enamel are broken away, there, unquestionably, cohesive foil is the only proper gold to use. In such cases, as in others, there should be some point to retain the first pieces or narrow strips of foil and to keep them there as the grooves or anchorages are reached and filled, and the whole operation is completed. As to decay recurring about the fillings in cavities in the approximal surfaces, I would say that in all those cases where calcification is imperfect it is necessary to cut away tissue well out towards the buccal and palatal or lingual surfaces and towards the neck of the tooth, or a little beyond the margin of the gum, and so restore the contour of the parts that the margins of enamel may be free from contact with the adjoining tooth, and be kept so by the prominent portion of the gold so resting closely against, or being so knuckled-up to, the tooth adjoining, near the masticating and buccal surfaces, that food cannot wedge between the teeth. If such an operation be well performed, and the margins made free, these edges of enamel will be kept clean by the movement of the tongue or the washing of the fluids in the mouth; the gum protects the cervical wall, and decay cannot well recur.

Dr. I. J. Wetherbee, Boston, wished to enter his protest against the claim that cohesive gold cannot be used in all classes of cavities, and against the other claim made by several speakers as to the superiority of non-cohesive gold over cohesive for producing and perfecting the best possible fillings with gold. Parenthetically he would say that the softest form of gold is that which has been annealed. The claim, as set forth, that as perfect fillings cannot be made with equal facility with cohesive gold as with non-cohesive is purely factitious, and indicates a want of knowledge how such material is best manipulated, and of a deft hand to ultimate proper results. The object of a filling is to exclude all moisture. It matters not whether you fill with annealed or unannealed foil, some cases will fail in the hands of the best operators. Oftentimes the dentine may be bruised or chipped in the impaction of the foil. Wherever this is done you lay the foundations for decay. He asserted, without the fear of reasonable contradiction, that cohesive gold can be as closely and firmly placed against the wall of the cavity by any practitioner of respectable talent as non-cohesive. That cohesive gold requires in its use a variety of form well adapted to meet the exigencies of every case is true, as is indicated by the great diversity we find in form and position

of cavities. In a large approximal cavity in either a molar or a bicuspoid it is safe to commence the filling with semi-cohesive pellets, to which are to be added cohesive pellets, and so held in position, while the mallet-packer is used to condense, as to make sure it shall not be displaced. A retaining-point previously filled with cohesive foil will aid materially in the firm retention of the condensed pellet. During the process of filling care should be used to keep the gold in such form as not to interfere with proper access to all parts of the cavity yet unfilled. Intelligence should precede and closely watch every skillful effort in filling a cavity in a tooth. If a space the three- or five-hundredth part of an inch, or the one-thousandth, exist at the periphery of the cavity, it will prove fatal to both filling and tooth. This space cannot be detected by the unassisted eye. To be assured against such defects, the gold should be filed to one-forty-eighth of an inch of the periphery of the cavity, then heavily burnished with a lubricated burnisher (soap-suds is the best lubricant), so as to expand the periphery of the gold against and down upon the enamel at all points. The filling is then finished with file or pumice ribbons, being careful that the gold shall be finished even with the margins of the cavity. Approximal fillings should have a convex surface, with a wider space palatally or lingually as the case may be, that they may be more readily and effectually cleaned. He preferred pellets for large cavities, finishing with ribbons, annealed. For small cavities he uses ribbons exclusively, for the reason that in a given quantity of gold they are more portable. For strength, beauty, and durability, cohesive gold fillings are far superior to non-cohesive gold fillings. That some are not successful in its use, is no argument against its very general acceptance and use by the profession, but incontestable proof of the want of proper attainments for successful practice of a high order. Dr. Wetherbee deemed it proper to say that all the gold used in his position comes to him unannealed. It is made into pellets, cylinders, or ribbons while in an unannealed state. His pellets and cylinders are semi-annealed,—i.e., the surface is annealed, leaving them in the softest or best non-resistant form.

Dr. Mills. I cannot agree with the idea of Dr. Stockton that a young man could have listened to this discussion and not know what is going on. It depends upon the young man's judgment. Taking into consideration the auxiliaries that are brought to bear in regard to the salvation of teeth, I think we cannot claim that gold, the kind of gold, or even the ability of using it, covers the entire ground. According to my judgment, but one man has struck the keynote of the salvation of teeth, and I am very glad to indorse what Dr. Cook has said in regard to the matter of cleanliness. I regret to see how little attention this matter has had in our association. Give

me a man that has an earnestness in regard to the health and cleanliness of the mouth, and that man will save more teeth than the man of better ability who ignores that department. I am surprised to see so many patients as I do coming from the hands of men of ability and judgment who show so little evidence of understanding the necessity of cleanliness. It is an exception that a patient comes into my hands whom I have never seen before in whose mouth I find any marks of an effort in that direction.

Unless we observe this matter more closely, we have not got hold of the bottom plank of success in dentistry. It is the coming men that are going to take hold of this question. I agree with Dr. Allport in what he said last night. I think I got the spirit of what he meant. I have only this fault to find with his remarks. My impression was that such remarks from a man of his ability would seem to be giving encouragement to a sort of loose, easy way of filling teeth. He denies that, but they impressed me in that way as he made them. I do not undertake to deny that unannealed gold does not have its purposes. I have used heavy gold, and have found it a success, according to my idea of what success is. There is a mistaken idea that it is necessary to use great force in packing heavy gold. I do not disturb my patients in its use any more than other men do in using light foil. I recognize differences and individualities in men. I agree with Dr. Lord. I cannot denounce men's methods when I see good results. I have to say, in closing, that cleanliness is the bottom plank of success in the salvation of teeth.

Dr. G. F. Waters, Boston. Our work is not done when the tooth is filled. You have still a word of warning and advice to the patient, for much of the security of a filling depends upon the patient; and that word is to enjoin cleanliness of the mouth. Frequently he takes from the mouths of patients who think they keep their mouths clean a portion of soft matter from the interstices, and puts it under the microscope to show them the animalcules and vegetations that generate acid, which will flourish in a mouth not kept absolutely clean. He calls attention to the gums denuded of the mucous coat, and tells them that acids have done this, and asks them how they live. Almost invariably he finds that pastry, candies, or something sweet is used. He tells them that if they do not take care of the fillings in their mouths they will fail; if they do not keep their mouths clean, acids will have an opportunity to act on the parts of the tooth adjacent to the fillings, and will inevitably produce decay. Dr. Waters related an incident showing what may be done by close attention to the cleanliness of the mouth. When quite a young man he was called upon by a youth of seventeen or eighteen who desired to have his teeth cleaned. His mouth was in a filthy condition, showing such neglect, that Dr.

Waters came to the conclusion that it would be useless to clean it, as it was probable that in a short time it would be again in as bad condition; but he determined to give the boy a shock. He told him that his patients were fastidious, and if he undertook to clean those teeth his hands would be in such a condition that he shouldn't dare to attempt to operate for one of his patients for at least twenty-four hours, and he would be obliged to spend the greater part of that time scrubbing his hands to rid them of the offensive odor. The young man left the office. Twenty-five years afterwards he was stopped on the street by a stranger, who asked him to look at his teeth, at the same time opening his mouth to show them. Such a beautiful set it had never been his fortune to see elsewhere. Every tooth was perfect, and the mouth perfectly clean. The man then informed him that he was the boy whose teeth he (Dr. Waters) had refused to clean many years before, that the lesson had been ingrafted into him, and that he had set to work on his teeth and attended to them faithfully, with the result seen. Dr. Waters concluded by saying he assured his patients that poor fillings would serve them better in a clean mouth than the best work would in a neglected mouth.

Dr. E. S. Talbot, Chicago, presented to the association a set of instruments* for reaming out nerve-canals previous to treatment, with the right of manufacture, and explained their use.

On motion of Dr. Atkinson, the offer of Dr. Talbot was accepted by the association with thanks.

Section Fourth was passed.

(To be continued.)

CENTRAL PENNSYLVANIA DENTAL ASSOCIATION.

THE seventh annual meeting of the Central Pennsylvania Dental Association was held at Bellefonte, Pa., July 26, 1880. The following officers were elected for the ensuing year:

President.—Dr. M. L. Logan.

Vice-President.—Dr. J. C. M. Hamilton.

Treasurer.—Dr. W. B. Miller.

Corresponding Secretary.—Dr. J. L. R. Heichhold.

Recording Secretary.—J. D. Geissinger.

J. D. GEISSINGER, *Recording Secretary.*

* These instruments were illustrated and their use explained by Dr. Talbot, in the DENTAL COSMOS for October, 1880.

LEBANON VALLEY DENTAL ASSOCIATION.

THE Lebanon Valley Dental Association will hold its semi-annual meeting at the Eagle Hotel, Lebanon, Pa., on Tuesday, November 16, 1880. The following essays will be read: "Eclectic Dentistry," by J. H. Mease, D.D.S., Lebanon, Pa.; "A Single Tooth," by C. V. Kratzer, D.D.S., Palmyra, Pa.; "Dental Nutrition," by J. E. Slegel, D.D.S., Reading, Pa.

Assigned subjects for discussion: 1st, "The best method of attaching artificial crowns;" 2d, "How can we best enlighten the public with regard to a proper care of the teeth?"

The presence of dentists generally is desired.

C. V. KRATZER, *Recording Secretary.*

EDITORIAL.

ANOTHER CHAPTER IN THE FRAUDULENT DIPLOMA TRAFFIC.

As most of our readers are probably aware, through the facts having been extensively published in the newspapers, Dr. John Buchanan, dean, etc., of bogus diploma notoriety, was supposed to have committed suicide by precipitating himself into the Delaware River during a night trip of a ferry-boat plying between this city and Camden. It turned out, however, that this was only a ruse on the part of the dean and his friends to divert attention from his flight. He was subsequently arrested in Michigan, brought to this city, and is now in prison awaiting trial.

Meanwhile, the charters of the "Eclectic Medical College of Pennsylvania" and the "American University of Philadelphia" have been annulled by the courts. The readers of our July number will remember these institutions as the chief offenders in the matter of issuing fraudulent diplomas, both being under the deanship of Dr. Buchanan. On the 30th of September replications were filed in the Court of Common Pleas, in Philadelphia, to answers submitted by these institutions to the complaints of the Commonwealth. Their answers set out that they claimed to exercise their rights, privileges, franchises, etc., by virtue of an act of Assembly dated February 25, 1850, incorporating the Eclectic Medical College of Pennsylvania, and an act of March 26, 1867, incorporating the American University of Philadelphia. The replications to these answers averred that the above corporations had forfeited their charters because of, first, the conferring of degrees upon persons not possessing qualifications such as their charters prescribed; second, the sale of diplomas; third, the granting of degrees of doctor of medicine and antedating such diplomas in order to make it appear that the recipient had the right

to practice medicine; and fourth, the issuing of diplomas with forged signatures. After the replications were filed, counsel for both of the defendants confessed judgment of ouster in favor of the Commonwealth, a part of the record being a letter from Dr. Buchanan authorizing such a course. We trust this will end this nefarious business so far as Philadelphia is concerned.

In this connection we may notice the exposure of a similar fraudulent institution in Boston, Mass., by a reporter of the *Herald* of that city. One "Dr." Harry C. Stickney seems first to have brought the institution into existence at Manchester, N. H., about 1875, by procuring an act of the Legislature incorporating the "New England University of Arts and Sciences." It was subsequently discovered that the college was being conducted in a fraudulent manner, and the bill incorporating it seems to have been repealed. But in the mean time Stickney had removed his base of operations to Boston. In 1877 information was received from the United States consul at Brunswick, Germany, to the effect that parties in that country had got into trouble by practicing under elaborately-engraved diplomas in Latin from this institution, with signatures of undiscoverable officers attached. Stickney is supposed to have turned out about one hundred "doctors," the price of diplomas ranging from one hundred to one hundred and forty-five dollars. The plates from which his Manchester and Boston diplomas were struck have been discovered, and he now seems in a fair way of meeting that justice which such practices merit, having acknowledged the substantial correctness of the charges brought against him.

We may as well note that our attention has been called by a correspondent to the fact that a corporation has been formed, to be known as "The Wisconsin Dental College," the same to be located at Delavan, Walworth Co., Wis. The names of the corporators are George Morrison, John Morrison, and D. B. Devendorf. Our correspondent further declares that one of the said corporators—viz., George Morrison—is traveling through Wisconsin disposing of diplomas of the afore-mentioned college on reasonable terms for cash. We shall be happy to correct this statement if it can be shown to be incorrect.

PERSONAL.

NATHANIEL T. ERWIN, a pupil of Dr. E. C. Wise, of the city of Mexico, has received the diploma in dentistry from the "National Medical School of Mexico," after having attended the course and sustained the requisite examination.

BIBLIOGRAPHICAL.

A PRACTICAL TREATISE ON MECHANICAL DENTISTRY. By JOSEPH RICHARDSON, D.D.S., M.D., Professor of the Principles of Prosthetic Dentistry in the Indiana Dental College; formerly Professor of Mechanical Dentistry and Metallurgy in the Ohio College of Dental Surgery. Third edition, revised and enlarged, with one hundred and eighty-five illustrations. Published by Lindsay & Blakiston, Philadelphia, 1880.

This revision and enlargement of the leading standard work upon Mechanical Dentistry comes at a moment of newly-awakened interest upon this of late too much neglected branch of the dental art. In this sense the appearance of the new edition is opportune, and a careful examination of the work must satisfy the most critical that in his task of revision, emendation, and addition the author has in the main exercised a wise discrimination and kept well abreast with the progress of the art.

Part First of this work is devoted to metallurgy, beginning with a chapter upon "different modes of applying heat," by blow-pipes, lamps, furnaces, etc.

In addition to old matter upon the subject, a large amount of space has very properly been devoted to a copiously illustrated description of such portion of the Fletcher heating apparatus as is adapted to work in the dental laboratory. This includes several varieties of bellows blow-pipes with the air-current central to the gas flame; an old-fashioned fireplace bellows worked by the foot, and made effective for blow-pipe operations by the simple addition of an elastic rubber distributing reservoir for the current of air; and a wonderfully compact gas or petroleum furnace, hardly larger than a two-quart measure, in which half a pound of cast iron can be fused in from seven to ten minutes.

The chapters devoted to the practical working of the various metals used in mechanical dentistry are, on the whole, ample and satisfactory. An exhaustive treatise upon dental metallurgy would, of course, demand a volume in itself. It would have been well, however, if in the chapter on silver the author had given one or two of the simple methods of refining by the humid process, as they are really the most generally practicable and effective for laboratory work with this metal.

Part Second opens with a chapter on the "treatment of the mouth preparatory to the insertion of artificial dentures," in which the author strenuously insists upon the removal of "useless and diseased remains of teeth" preparatory to the insertion of an artificial denture. While his doctrines upon this subject are perfectly just as applied to

really *useless* remains of teeth, advanced dental practice is daily restricting the application of that qualifying word to diseased dental organs. A large percentage of diseased roots can, by the better methods of treatment now so generally introduced, be placed in a perfectly sound and healthy condition with very little danger of "a recurrence of the morbid action," which, the author states, usually exists in such cases. Prof. Richardson's objections to the retention of even sound roots as "a fixed and permanent basis for the dental appliance" are thus stated by himself (p. 99):

"If a dental substitute is adapted with necessary accuracy to all the parts which it covers, it will be plainly seen that the forces applied to the base at every occlusion of the jaws in the act of mastication, instead of being equalized or diffused, will be expended mainly on the roots, inasmuch as they afford so many fixed points of resistance, whilst the adjacent soft tissues, yielding to the pressure, permit the artificial pieces to bear with undue and unequal force upon the former. The consequences of this action are inevitably pernicious," etc.

Inasmuch as the very function of the roots of teeth is precisely to meet such resistance and save the soft parts from pressure, the cogency of this reasoning is not manifest. Certainly a sound root remaining in normal relation with associated teeth of a serviceable character renders an important service if it receives the pressure of an artificial denture at that point, and thus prevents that denudation of the necks of such teeth which always results when the force of occlusion falls directly upon those soft tissues which are their natural covering. Not all roots can be utilized in this or any other manner, and in such cases the principle of extraction is sound; so, too, with hopelessly diseased roots, the presence of which in the mouth can never be otherwise than pernicious; but the conservative dentistry of to-day cannot admit that, save in exceptional cases, the functional usefulness of a tooth ceases when the crown has undergone disintegration.

This chapter upon the treatment of the mouth was written and published twenty years ago. Would it not have been well for the author to have revised his teaching upon this subject in the light of modern therapeutics, and of those many admirable means of utilizing roots and fragments of teeth an account of which he has embodied in the pages of this revised edition?

Several pages of this work are devoted to "material and methods employed in obtaining impressions from the mouth," and they are well and clearly written. In his observations on the taking of plaster impressions the author states that "There are conditions of the mouth incident to the presence of natural teeth within it which preclude the use of plaster in taking an impression of the parts."

Among these he enumerates enlarged crowns, obliquity of teeth, etc.

This is opposed to the best teaching upon the subject, which is that the greater the difficulty of the case the more absolute is the necessity for the use of plaster of Paris, for the greater must be the distortion of an impression made with any less resisting material in its removal from the mouth. Several methods of overcoming the mechanical difficulties involved in taking plaster impressions under such circumstances are given, but among them we do not find the very valuable expedient of taking the impression in sections.

One of the most valuable features of this revised edition is the chapter devoted to pivoting artificial crowns. It is ample in text and copious in illustration, containing many of the very latest improvements in these processes. The illustrations on page 148 of excising forceps for the removal of fragments of roots or crowns might well be omitted. The author fully exposes the dangerous results which may follow their use, and certainly no one possessed of a corundum disk, or even a common file, would think of availing himself of such unreliable and clumsy instruments as those alluded to.

With respect to bases, the author regards vulcanite as occupying in the minds of the profession a "middle ground between condemnation and approval," and he regards the "growing distrust as to its fitness" as pointing "to the conclusion that, at no distant day, it will be classified among the obsolete processes." Of which hopeful prognostication the profession at large will heartily wish a speedy fulfillment.

High praise is justly awarded to that form of artificial denture made upon a metallic base, with a rubber or celluloid attachment for the artificial teeth, as being at once light, strong, cleanly, and healthful. Large space is devoted to the celluloid base, and full descriptions are furnished of the methods of preparing a denture from this material. A separate chapter, fully illustrated, is given to the new "gold alloy cast base" process; and the "continuous gum" process and formulæ receive a share of attention, as does the now nearly lost art of carving block teeth. The description of the latter process might, however, be readily improved. The methods described are not by any means those of the best block carvers, and many practical points in detail are not touched upon, although they are essential to success. The author is mistaken in stating (p. 300) that the gum enamel should be the first of the enamels applied after the biscuiting process. On the contrary, it should not be applied until the yellow and point enamels of the teeth are in position and fully carved into shape. The gum enamel is then adapted to the shape of the teeth, and not the shape of the teeth to the gum enamel.

The concluding chapter of this work relates to "defects of the

palatal organs and their treatment by artificial means." This chapter is a contribution from the pen of Prof. Norman W. Kingsley. It appeared in an earlier edition of the work, and hence no mention is made of Sürsen's very valuable form of obturator. But Prof. Kingsley does full justice to Sürsen's process in his recently-published and widely-commended treatise on the subject of Oral Deformities.

Taken as a whole, Prof. Richardson's work is a valuable contribution to the dental art, and is beyond all question the best treatise extant upon the general subject of mechanical dentistry.

W. F. L.

DISEASES OF THE THROAT AND NOSE, INCLUDING THE PHARYNX, LARYNX, TRACHEA, ŒSOPHAGUS, NASAL CAVITIES, AND NECK. By MORELL MACKENZIE, M.D. London. Vol. I. Diseases of the Pharynx, Larynx, and Trachea. Philadelphia, Presley Blakiston, 1880.

Although much of the material contained in this volume will seem familiar to the readers of the *Lancet* and *British Medical Journal*, we are assured by the author in his preface that by far the larger portion of the matter is now published for the first time. Be this as it may, no practitioner whose professional duties have ever compelled him to assume charge of the many troublesome and obstinate diseases affecting the laryngeal and naso-pharyngeal regions can afford to be indifferent to a publication of this character, which brings together and formulates for the first time the results of the exceptionally large experience of one of the most distinguished of English specialists.

The volume in question includes the diseases of the pharynx, larynx, and trachea. Post-nasal catarrh, granular pharyngitis, tonsillitis, wounds and foreign bodies in the pharynx, the throat affections of the eruptive fevers, cancer, non-malignant growths, and syphilis of the pharynx, are all exhaustively discussed. In regard to the occurrence of the primary sore of syphilis in the pharynx, the author's observations confirm those of Diday and Desnes, to whose writings he refers the reader for information concerning the revolting practices which give rise to this disease. As would be expected on *a priori* grounds, the great majority—six out of seven—of patients thus affected were women. The description of the various appearances characteristic of the different stages of syphilis affecting the throat is admirable, but in regard to treatment the author is at variance with most of the distinguished syphilographers of the day, advising local treatment only in secondary affections, and declaring that the non-use of mercury at that time does not increase the risk of further later developments of the disease. We think that few surgeons of

experience would agree with him, or would feel justified in withholding mercury from a patient in that condition.

The section on the larynx is prefaced by a description of laryngeal instruments and their modes of employment, and includes all the known diseases affecting that portion of the respiratory tract. That on the trachea is equally comprehensive. Each section is prefaced by a concise description of the anatomy of the regions to be considered. An appendix gives a number of valuable formulæ for inhalations, lozenges, insufflations, etc.

Typographically, the work is most excellent, and both for its clear, fluent style, making it pleasant reading, and for its value as a work of reference and a guide in the many troublesome diseases of which it treats, we regard it as one of the most valuable of recent additions to medical literature.

We shall look with interest for the publication of the second volume.

SCHOOL AND INDUSTRIAL HYGIENE. By D. F. LINCOLN, M.D. Philadelphia, Presley Blakiston, 1880.

This little work is No. XII. of the American Health Primers, and fittingly concludes that admirable series of essays.

Dr. Lincoln's work necessarily touches ground covered more in detail by other volumes of the series, and it is, for that reason, all the more comprehensive. The chapters of the first part discuss the general hygienic principles relating to food, sleep, study, and exercise, which are often misunderstood or overlooked by teachers and parents. The second part takes up, more briefly, the same principles with reference to the workshop. The facts and suggestions bearing on the sanitary arrangement of schools and factories, the special dangers of certain pursuits, and the hours of labor and recreation, are of the highest interest and importance.

We heartily commend this book to the public, especially to those who have the care of children, and take this occasion to say further that this whole series, comprising twelve small but pregnant volumes, ought to be in the hands of every family in the land.

SLIGHT AILMENTS, THEIR NATURE AND TREATMENT. By LIONEL S. BEALE, M.B., F.R.S., etc. Octavo, pp. 353. Philadelphia, Presley Blakiston, 1880.

This work is not intended as a book of reference, but as a volume which young practitioners, students of medicine, or indeed intelligent laymen, may read consecutively with profit. The book is full of practical suggestions,—the fruit of an extensive experience,—which are presented in a conversational style and adapted for easy comprehension. Among the subjects discussed are the common forms of slight inflammation, the feverish state, neuralgia, rheumatism, ner-

vousness, biliousness, diarrhœa, constipation, indigestion, and loss of appetite. No intelligent person can read the book without being amply repaid therefor in its conservative and wise counsel.

OBITUARY.

ACTION OF THE DENTAL PROFESSION WITH REFERENCE TO THE DEATH OF DR. SAMUEL S. WHITE.

AMERICAN DENTAL SOCIETY OF EUROPE.

At the last meeting of the American Dental Society of Europe, held at Lucerne, August 30 to September 2, 1880, the following resolutions were unanimously adopted:

WHEREAS, It has pleased Divine Providence, since our last meeting, to remove from this sphere of his usefulness, our esteemed friend DR. SAMUEL STOCKTON WHITE; therefore,

Resolved, That in this event we recognize the loss of one who, by his wide intelligence and great business capacity, has rendered exceeding great services to the profession at large, and to whom the American dentists practicing abroad have been under very special obligations.

Resolved, That we tender to his family and friends the assurance of our sincere sympathy in their sad bereavement.

W. D. MILLER, *Corresponding Secretary*.

DR. J. T. HOLMES.

Died, at Macon, Ga., July 31, 1880, DR. J. T. HOLMES, in the forty-fourth year of his age.

DR. HOLMES was born in Hinds County, Miss.; graduated with honor at the University of Mississippi, and attended a course of medical lectures; served in the Southern army during the war, at the close of which he adopted dentistry as his profession, which he practiced for several years at Canton, Miss. He went to the home of his brothers, in Macon, Ga., a short time before his death. He was of a modest and retiring disposition; was regarded by the dental profession as a man of good attainments, and was esteemed by his friends as thoroughly conscientious and honorable.

PERISCOPE.

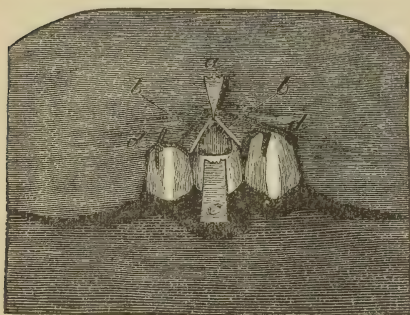
EROSION.—(Concluded from page 507.) Referring to Fig. 4, the difficulties to be surmounted are at once apparent, as the tendency of the rubber dam when forced beyond the gum is to seek the level of the festooned border. The means usually employed in similar cases is the adaptation of a clamp—reniform—to the tooth, the portion to be applied to the labial surface being aciform, while the other, to be

placed on the lingual aspect, is bifurcated: it, however, cannot be considered free from objections, as it obstructs the light and impedes the hand in its action, as will be seen by reference to Fig. 4.

The peculiar shape of the cavity, Fig. 4, nullifies any advantage this clamp may possess, for with the most careful adjustment it will only retain the rubber at one point, nor can any other clamp be selected presenting pre eminent merit. When caries extends to a point beyond the margin of the gum, that portion of the clamp placed on the lingual aspect of the tooth not infrequently is the cause of so much suffering that the patient insists on the abandonment of the work. For this reason I have endeavored to dispense with its use, adopting a method which I shall now describe previous to clinical illustration.

It will be noticed, when adjusting the rubber, that its collar-like formation serves to steady it in position; but when forced beneath the festooned border of the gum on

FIG. 4.



The above represents the rubber adjusted on a bicuspid with a clamp, broken, the upper part of which is thrown back to fully expose the morbid part being operated upon.

a, Aciform extremity of clamp laid back, but with its point in position on upper edge of the cavity and between the incised portion of the gum.

b b, Rubber, extending from point of clamp to the interdental spaces, showing reflected edges upon the cavity, with open segments on either side.

c, Arching portion of clamp, a continuation of the broken part of which would partly conceal the cavity and the point of the clamp.

d d, Ligatures.

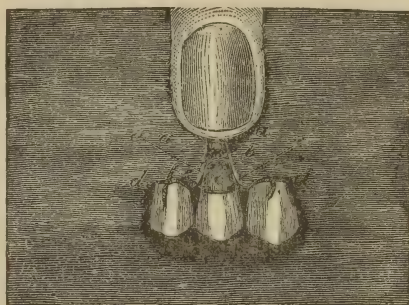
tooth, and at the same time depressed below that level on the other, the elasticity of the material continually inclines the collar to return to the horizontal equilibrium. Without a projecting point on which to retain the rubber, such a return would soon occur; but if a prominence, sufficiently abrupt, be established on the surface of the tooth, this progressive motion will be arrested (see Fig. 6). This can be effected by building the gold beyond the edges of the cavity until it forms a ridge following the sinuosity of the edge of the cavity, upon which the rubber can rest. After dissecting away a portion of the gum—an inter-

val being allowed for the cessation of hemorrhage—the dam is to be adjusted on three teeth; the tooth to be operated upon occupying the central position. The adjustment of the rubber on the adjacent teeth is preserved against derangement by the additional precaution of a silk ligature round each tooth. The next stage of the operation is now entered upon,—as shown in Fig. 5,—and consists of the withdrawal, by digital compression, of the dam from the proximity of the cavity. The tension of the rubber, being considerable, extending to the orifices through which the approximal teeth are passed, results in the encroachment of the fluids of the mouth on the territory to be operated upon; and only by careful ligation, previously alluded to, can the retrocession of the rubber from the associate teeth be prevented.

This diagram is intended to illustrate the preparatory steps and

first stages of filling, previous to removing the finger from the rubber, which is firmly held in position as so delineated. The superstructure is then commenced by building in the three anchorages which are made in that portion of the tooth hitherto overcast by the festooned border of the gum, carrying the gold up in a divergent line, extending crescent shape until raised above the general level of the tooth. The length of this preliminary portion of filling should be sufficient to prevent the funicular formation, caused by the distended portion of rubber, from encroaching upon the mesial or distal edges of the cavity. The prominence, which we will designate a reef, is supported by additional gold until its position as an abutment is secured. During the period of the forcible retention of the rubber it is continually inclining to release itself, and on the withdrawal of the finger contracts upon the gold, which is then worked over and upon it, as shown in diagram 6.

FIG. 5.



- a, Showing point at which rubber is confined by digital compression.
- b, Incised edge of gum.
- c, The cavity.
- d d, Ligatures upon the canine and second bicuspid.
- e e, Edges of rubber.
- f, Anchorages, five in number.

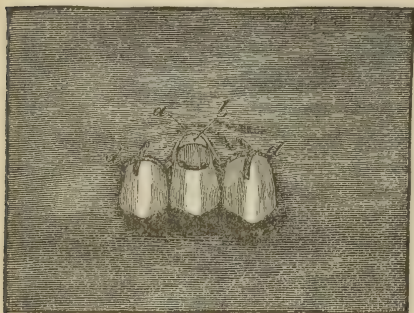
In the use of the clamp, as shown in Fig. 4, the preparation of the cavity differs in this respect,—that, instead of five retaining-points, three only are necessary, each of these being located at the extremity of the angles. But in the figure before us (5), instead of one, three anchorages are required in the apex of the cavity, to assist in building the lunate arch which is to resist encroachment of the rubber upon territory absolutely necessary to be protected.

The advantages secured by this method are so important that I shall discuss them at full length. The generally diffused but gentle pressure of the rubber in its tendency to return to its original shape is met by an equally uniform resistance; every point of the edge of the elastic material, when coming in proximity with the curved periphery of the cavity, is met and contested by the gold reef established at the cervical border, the pressure being almost imperceptible in its contractility on the tooth and parts contiguous. The cornua of the golden crescent are so widely separated as to prevent the rubber trespassing again upon the edges of the vertical walls of the cavity.

Looking at the figure, it will be seen that, from the distance to which the cavity extends below the general gingival border, any clamp which might be applied on the cervico-buccal aspect would inevitably cause pain by pressure on the lingual gum. In such an instance, it is compulsory to place the clamp in a vertically-oblique position, while its tendency to contract causes it to advance upon the lingual wall of the tooth, acting in an aggressive manner upon the gum, and resulting, as already stated, in discomfort to the patient, which increases the difficulties to be contended with.

But there being an entire absence of painful pressure in the method now described, it becomes possible, *cæteris paribus*, to combat the influences that otherwise might frustrate every measure put forth.

FIG. 6.



a Shows the rubber contracting upon the collar-like formation of gold, *b*, which is built, crescent shape, upon the cervical portion of the tooth; the outer portions indicating points to which the filling is to be built previous to relaxing pressure upon the rubber.

d d, Ligatures.

Before concluding my remarks upon the rubber, I may add that it should not be kept on hand in any great quantity, as it suffers a subtle deterioration by age, becomes rotten, and therefore valueless in cases where its use is most essential.

Experiments made on the india-rubber of commerce prove its degenerating qualities, for when exposed to light it has been found to absorb oxygen: "Five hundred grains of virgin caoutchouc,

cut into the form of a tape," gained "fourteen grains in the course of nine months," "by absorption of oxygen; it became brown, soft, and sticky." "It gave up 11.81 per cent. of an oxydized, soft, and viscous resin to alcohol," which indicates that the rubber-dam sheeting should be excluded from light and air as much as possible.

This last remark may be appropriately made in regard to most of the appliances of operative dentistry, as the condition of the instruments, the working qualities of gold, and the elasticity of the rubber are all of them more or less affected by any unnecessary exposure to atmospheric changes.—*Clinical Lecture by W. Finley Thompson, M.D., D.D.S., at National Dental Hospital, London, in Monthly Review of Dental Surgery.*

HINTS AND QUERIES.

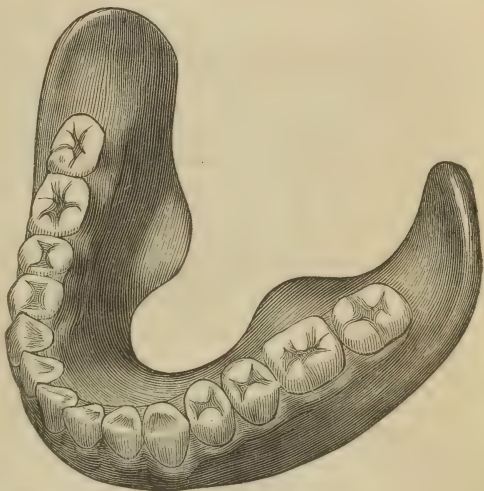
"He that questioneth much shall learn much."—BACON.

CORRESPONDENTS desiring a reply in this department are requested to make use of *distinctive signatures or initials*, and avoid the practice of signing their communications Reader, Subscriber, etc.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names. We cannot insert queries or replies except they are so accompanied. Names not necessarily for publication.

SECURING PLATES AFTER ABSORPTION OF ALVEOLAR PROCESSES.—In March, 1879, a lady presented to have a lower set of teeth made. The alveolar process had been entirely absorbed; there was absolutely no ridge. I proposed a very heavy gold plate, with rubber-mounted teeth, but the patient desired a rubber plate. Reluctantly yielding to her wish, I took an impression, and realized the difficulties that I had anticipated. The base plate with the teeth mounted would not settle into place. I trimmed it to free it from the membranous folds, but did not feel satisfied that the plate could be worn with comfort. Not knowing, however, what better to do, I concluded to finish it, hoping that it might answer, and was just about dismissing the patient to continue the work, when

the following plan suggested itself, and, simple as it is, it proved to be just what was required. I attached wings or projections from the second bicuspid to the end of the first molar. Finding that these steadied the plate, I added more material, and made the plate as broad as I could, and with long projections at the coronoids. The wings were only an eighth of an inch in thickness, and so shaped as to lie smoothly under the tongue. The patient was told to lay the tongue on these wings to steady the plate, especially in mastication, and that, as a natural consequence, she would be enabled to wear the plate with increasing comfort, the longer it was used, the muscles becoming trained. Having had the opportunity of examining this case from time to time, I found that it gave the wearer increasing satisfaction, which settled the question of the practicability of the device.



In a second case, inserted on the 30th of August, 1880, I made the plate larger, and it, too, proving satisfactory, I have thought that a description and illustration might be useful to other members of the profession.

The stability of the plate increases in proportion to the thickness of the wings, but it is not well to have them thicker than above indicated, as they might prove troublesome and irritating to the tongue.—JAMES GORDON, *St. Thomas, West Indies*.

GOLD CROWNS.—What Dr. Talbot wrote about gold crowns in the September number of the *DENTAL COSMOS* is very important, but some things he omitted are also very important to the success of these operations. If the modes and manipulations Dr. Talbot describes are not fresh in the reader's memory, he will note, on again reading his article, that it is not a difficult operation to make and insert a crown as he describes. But we are very positive that of one hundred crowns inserted in that way ninety-nine will be faulty, and if one be perfect it will be so by chance, and not by virtue of scientific manipulation.

The root being prepared and the crown ready for insertion after his method, the all-important point is to get the crown attached to the root, not merely so it will look well and bear the force of mastication, but so as to make the connection between the crown and root perfectly moisture-tight. How does Dr. Talbot get just the exact quantity of gutta-percha into his crown? And if perchance he should approximate this, the root is moist, and moisture-tight adhesion will not take place between filling and root. If any of the cements are used, another equally serious difficulty is met with: the oral fluids interfere with their crystallization, and very soon there is no filling just where it is most needed,—between the rim of the crown and the root. Perfection here is the important point in the operation. This joint must be moisture-proof, or the crown will soon be without a foundation. How shall we manage, then, to insert a crown so that there will

be no guessing or chance-work in making a perfect union possible? Suppose the root we wish to crown is that of a lower molar. Fit the band that forms the lateral walls of the crown as Dr. Talbot directs; secure correct occlusion with the upper tooth. The band, being of fine gold and quite thin, should be strengthened by soldering a narrower band inside of it,—not low enough to interfere with the fitting on the root; put the rim of the crown on the root; fill with wax; close the mouth, and thus secure a perfect impression of the antagonizing tooth. Now remove the rim; harden the wax in cold water, and remove it from the rim. This wax is a *fac-simile* of the grinding-surface of the required crown, and we want a piece of gold to correspond. Take an impression of the grinding-surface in plaster. Into the mould thus formed place the quantity of gold required, and melt it in a furnace or under the blow-pipe. It will assume the exact form of the wax and fit the rim of the crown. Now put the rim on the root; adjust the dam carefully below the margin of the rim; make anchorage by screws or undercuts; then thoroughly dry the rim internally till the root is warm; then fill with gutta-percha so warm that perfect adhesion is secured, and a perfectly moisture-tight joint between root and rim is secured. Fill the remaining portion of the rim with gutta-percha or any cement preferred, leaving room for the grinding-surface piece, which may be anchored by loops or pins soldered on its inner surface. By this method the unsoldered joint on the grinding-surface may mar the beauty of the crown, but it is no real defect, and allows precise manipulation where it is most needed. This operation may be modified, saving labor and expense, by omitting the grinding-surface piece and filling the rim with cement or amalgam. A gold rim as described filled with amalgam makes a serviceable crown, and is quite a simple operation. This plan needs to be modified to adapt it to canines and upper incisors. But gold crowns, no matter how inserted, are too gaudy for these teeth. Porcelain crowns, properly pivoted, are far preferable.—W. H. ROBINSON, A.M., D.D.S., *Suisun, Cal.*

NEW METHOD OF CAPPING AND FILLING PULP AND NERVE CANALS.—The annoyance caused by liquid gutta-percha adhering to the margins of the cavity when applying it as a first coating to an exposed pulp accidentally led to the discovery of the following method of using gutta-percha. From the common pink-colored sheet gutta-percha cut a thin shaving, in size to suit the case in hand; with pliers lift and dip it into chloroform; carry to and place with gentle pressure over the exposed pulp. The chloroform instantly softens the surface of the gutta-percha sufficiently to cause it to adhere, and, if ordinary care is exercised, no daubing of the marginal walls will trouble the operator, as in using the liquid form of the same material. Less pain is produced by its use in this way, as there is *less* chloroform brought into contact with the pulp. Evaporation occurs rapidly, and a plastic cement may be applied upon the gutta-percha, at once, or a gold or amalgam filling may be completed at the same sitting without fear of painful results. This latter suggestion as to finishing the filling applies specially to recently-exposed and healthy *pulps*, where but little or no inflammatory symptoms exist. For filling nerve canals, this way of using gutta-percha will be found to be far more satisfactory than the method by heat, as usually practiced. A tapering strip, cut from the gutta-percha sheet and dipped into chloroform, will pack into a canal with greater facility, and stay where it is put, with less effort than when heated over the flame of a spirit-lamp. This method may have been practiced by others, but I have no knowledge of the fact. A trial will convince the most skeptical of its value.—S. ARTHUR GARBER, D.D.S.

THE
DENTAL COSMOS.

VOL. XXII.

PHILADELPHIA, DECEMBER, 1880.

No. 12

ORIGINAL COMMUNICATIONS.

ANÆSTHESIA.

BY W. C. BARRETT, M.D., D.D.S., BUFFALO, N. Y.

(Read before the American Dental Association, at Boston, August 5, 1880.)

ALL through the centuries of time man has been endeavoring to find some way of escape from the penalties of broken law; to avoid the pain naturally consequent upon disordered function, or the lesions produced by accident; but until the nature and action of the so-called anæsthetics became known, his efforts were futile, or at the best but incomplete.

There are a number of different states which may be induced in which, while the condition remains, patients are insensible to pain, such as coma, syncope, anæsthesia, and sleep. The first three are pathological; the last is the normal condition of recuperation and recovery of wasted neural force. All these phases or conditions depend upon the nervous supply, and are induced by normal or abnormal nerve-currents.

There are certain drugs whose office seems wholly connected with the nervous system. Of these are nervous stimulants and sedatives, and a distinct class which are denominated anæsthetics. The mysteries of nerve force or of nervous supply have never yet been bared to human knowledge. We experiment and deduce so-called laws, but those laws are not general; they have so many exceptions that at present it is impossible to say how certain of these principles effect their marvelous purpose. Of some agents we know that their action is entirely reflex, and that the nervous system is affected through certain definite organs. But there are others of which this seems not to be true, and the scientific world is now engaged in the effort to solve this mysterious problem. So far, comparatively little progress has been made, and since the day of Claude Bernard, who advanced the theory that such agents as directly affect the nervous functions do it

by a coagulation more or less complete of the protoplasmic elements of nerve tissue, nothing but barren hypothesis has been advanced.

Of the various impressions which medicinal agents may exert upon nervous function, let us confine ourselves to that state called anæsthesia, as the most important to the practitioner of dentistry, only considering stimulants and sedatives as they may be incidentally connected with our subject.

Narcosis or anæsthesia may be considered as a state of paralysis of the sensory nerves, with insensibility or complete stupor. It is the suspension of sensation, and is the effect wrought by a number of agents, the most complete and powerful of which is hydrocyanic acid. But there are certain inciting agents or conditions aside from the direct action of drugs. In warm-blooded animals anæsthesia or insensibility to external impressions is produced by cold, or the lowering of the bodily heat, and in cold-blooded animals by the raising of the temperature. We are all familiar with the effect produced upon our own members by a long exposure to a low temperature, and we are conversant with the dreaded drowsiness which benumbs the faculties of a freezing person, which renders him insensible to pain and prompts him only to lie down and sleep. The same effects are produced upon a cold-blooded animal if the temperature be unduly raised.

EXPERIMENT 1.—Place a frog in a vessel containing water of 100° F., and it soon exhibits the same inertia and desire for sleep as the freezing mammal, and in a little time becomes quite insensible. If it be now removed to cold water it speedily recovers; but if long continued in the warmer fluid it dies.

The most common agents used to produce an artificial anæsthesia are nitrous oxide gas, chloroform, sulphuric ether, and bromide of ethyl. But carbonic acid, carbonic oxide, coal gas, olefiant gas, fumes of lycopodium giganteum, aldehyde, acetone, and other gases, when inhaled, may produce a like insensibility to external impressions. As, however, they are not commonly used to induce anæsthesia, we will not now particularly consider their properties.

How do these agents produce their characteristic effects? As I have said, this is a question which has not, so far, been satisfactorily answered. But, though no one can give an undisputed demonstration of their manner of action, there are certain phenomena the consideration of which may assist us in coming to some conclusion upon the subject, and these we will examine.

Claude Bernard says that an anæsthetic is a drug which produces a direct impression on nerve tissue. Prof. Anstie says that the peculiar effects are through a modified blood-supply, or by alteration of nutrition, and most modern physiologists agree with him. Which is right? It is certain that anæsthetics are amenable to that law which

is universal in therapeutics,—that to produce its characteristic effect a drug must be first introduced into the system, and that the method of its diffusion is through the blood.

EXPERIMENT 2.—Expose the lumbar nerves of a frog by raising the point of the sacrum. Pass a ligature around the whole body, excluding these nerves, and then inject the posterior extremities with woorari, or strychnia, or chloroform, and it will be seen that the anterior extremities are not paralyzed or convulsed, showing that the influence is not extended through the nerves.

To produce anæsthesia it is also quite true that there must be sufficient of the agent existing in the blood at one time. Ether and chloroform are eliminated almost entirely by the pulmonary mucous membrane. If of either a much more than sufficient quantity to produce anæsthesia be slowly injected directly into an artery, the characteristic effect is not seen.

EXPERIMENT 3.—Into the peritoneal cavity of a cat was very slowly injected ʒii of Squibb's chloroform, and the animal was but little affected. At another time I quickly injected ʒi of the same, and complete narcosis ensued.

When the drug is administered slowly the immunity is due to the fact that it is eliminated before it has time to exhibit its characteristic effect. Not enough is existent in the blood at one time to induce narcosis.

The most characteristic effects of common anæsthetics are produced when their vapor is inhaled, because it is thereby most readily introduced into the blood. The immense surface (about 1400 square feet) presented in the lungs of man brings the blood in osmotic contact with so much of the vapor that the pulmonary circulation is completely charged with it, and this is carried immediately to the heart, and thus distributed to the remotest part of the system without an opportunity being given for its elimination. But if an anæsthetic agent be injected into the venous circulation, little effect is produced, because it is carried directly to the heart, and from thence through the pulmonary artery to the lungs, where it is at once eliminated, never reaching the arterioles at all.

EXPERIMENT 4.—Into the jugular vein of a cat, previously anæsthetized, inject ʒi of sulphuric ether, and the animal will soon recover from the narcosis; while if it be injected into the carotid artery, it will deepen the influence.

We may then consider it demonstrated that the drug must be existent in the *arterial* blood in sufficient quantity at one time, in order to produce its characteristic effect. Now follows the important question: Is it simply held in solution in the serum of the blood, or is it conveyed by the corpuscles? If the answer be, in the serum, that solves the problem at once; anæsthetics manifestly are agents which produce a profound impression directly upon nervous tissue.

But microscopic and other examinations show that anæsthetics change the character of the blood-corpuscles. You are doubtless all of you aware of the effect of carbonic acid upon the blood. It makes bright arterial blood dark in color. Carbonic oxide has a directly contrary influence, and changes venous blood to a bright red. If ether be mixed with blood, it gives it a dark-purple color. It prevents its re-arterialization, and, more than this, it changes the character of the blood-corpuscle. It dissolves it, and sets free the hematine. This phenomenon is less plainly seen in blood during its circulation, but it may be discerned even there. Chloroform turns the blood a brilliant scarlet.

EXPERIMENT 5.—Add the vapor of chloroform, or ether, or carbonic acid, or carbonic oxide, to a bottle partially filled with fresh venous or arterial blood, and then agitate it, when the change in color becomes apparent. To demonstrate the fact that ether or chloroform dissolves the blood-corpuscles, place a drop of blood upon a microscope slide, add to it a few drops of the fluid and place under a half-inch objective. Ether effects a solution much more readily than does chloroform.

We see, then, that CO and CO² are the direct antitheses of each other in changing the color of the blood. But this difference is not more marked than is that between sulphuric ether and chloroform. Alcohol causes blood to assume a brick-red color, and air will not again arterialize it. Yet the arterialization of blood is not a physiological process, but is quite mechanical.

EXPERIMENT 6.—Procure a quantity of defibrinated blood, anæsthetize a dog, and open the thorax. Bleed him to death by opening the carotid arteries, or by severing the aorta. Quickly dissect out and sever the pulmonary vein and artery, and, charging a large syringe with the defibrinated blood, inject it into the artery until it exudes from the vein, to clear the lungs of coagulum. Remove the lungs, with a part of the trachea, into which insert the nozzle of a bellows. Charge the syringe with the defibrinated blood again, and force it through the lungs, when the stream will not be changed in color. Repeat this, directing an assistant to keep the lungs filled with air by means of the bellows, and it will be seen that the blood is now arterialized, or changed to a bright red, the same as during life. But if instead of forcing air into the lungs nitrous oxide or the vapor of ether or chloroform be substituted, definite modifications of the color are produced.

[*Note.*—My observations on this experiment are not as full or complete as I hope to make them during the coming winter.]

It is then demonstrated that anæsthetics have the power to modify the ability of the blood-corpuscle to absorb oxygen. Is it in this manner that we are to account for the physiological effects of these agents? Let us examine some other conditions which in some of their phenomena resemble anæsthesia.

During sleep, as in anæsthesia, there is primarily hyperæmia of the brain, as may be indisputably demonstrated.

EXPERIMENT 7.—Anæsthetize a healthy dog, and over one of the hemispheres of the brain make a crucial incision through the scalp. Dissect the flaps back, and trepan, using extreme caution to avoid injury to the dura mater. The flaps are now secured and the animal allowed to recover. After two days, to allow ample time for full restoration, the dura mater is exposed and the animal again anæsthetized. During the earlier phases, and exactly coincident with the chloroform excitement-stage of narcosis, there may be observed a distinct tumor of the dura mater. When anæsthesia is fully established, this is reversed, and a depression exists where had been the protrusion. When this phenomenon has been sufficiently observed, the dura mater should be carefully removed and the wound secured by means of the flaps of the scalp. After another interval the animal should be again anæsthetized, when the brain itself may be studied, and its periods of hyperæmia and anæmia carefully observed.

Asphyxia presents many phases which are not unlike those of anæsthesia, and it is essential that we be enabled to clearly understand the difference between them. It is the result of a deprivation of oxygen, and its effects are mainly manifest upon the medulla. The lungs have nothing to do with the desire of a suffocating animal for breath, nor has the blood, any further than as that affects the medulla.

EXPERIMENT 8.—A dog was anæsthetized and a bellows ligated in the trachea, so as to entirely control the supply of air. As long as the lungs were kept expanded by the bellows, it is evident that there would be no attempt at breathing on the part of the animal. An artery was now opened, and the dog bled so nearly to death that the heart almost entirely ceased acting. Notwithstanding the fact that the lungs were kept fully inflated, *the dog now gasped for breath*, because, from the lack of blood-corpuscles to convey it, the medulla was deprived of oxygen. A tube from the carotid artery of another previously anæsthetized dog was now connected with the jugular vein of the animal, and transfusion was accomplished, the regular lung inflations of normal breathing being kept up by the assistant, who worked the bellows in the trachea. When functional activity was fully re-established and sensation of the medulla re-awakened, the thorax was opened and the lungs and heart exposed. The pneumogastric nerve was now divided, the left ventricle of the heart opened, and at the same time the pulmonary artery ligated to cut off all blood-supply to the lungs. It will be seen that the heart and lungs were now both isolated, or paralyzed, yet *the dog gasped for breath*.

As long as the medulla is supplied with oxygenated blood there is no effort or struggle for breath, even though other organs may be deprived of it, but the instant that this nervous center is left without its needed supply there is a convulsive effort to breathe.

EXPERIMENT 9.—A bitch, two or three months pregnant, was anæsthetized and the uterus opened, exposing the quarter-grown fetuses to the air. They mani-

fested some uneasiness, but there was no symptom of any independent existence so long as the circulation of the mother was kept up. But when the umbilicus of any foetus was severed there was shortly afterward convulsive efforts to breathe. This was constant with five of them. The sixth was not separated until after the death of the mother and the stoppage of circulation, when this foetus also made the same efforts for breath.

In asphyxia the blood is dark in color, and there is the same anæmic condition of the cerebrum as in anæsthesia. The states of asphyxia and of anæsthesia are then analogous in many characteristic appearances, but I shall endeavor to show that there is a wide difference in their pathology; for while one is but the deprivation of oxygen, with the consequent characteristic effects upon the medulla oblongata, the other has added the positive presence of a toxicological agent which induces an added train of symptoms. The one is the cessation of function in the anatomical elements, the other is but a partial suspension in some of them. There are the same or analogous changes in the blood-corpuscles, and yet the pathological condition is widely variant. The one is the complete absence of oxygen from the medulla, the other is the possible partial oxygenation in the tissue elements.

Here, then, are two conditions analogous in their physical manifestations, both either produced by, or attended with changes in the blood-corpuscles, yet the one is entirely inconsistent with continued functional activity, the other quite compatible with life even indefinitely prolonged. This would seem to indicate that the suspension of sensation attendant upon both was due to widely different causes. At the outset of this paper, on the authority of Snow and others, I spoke of carbonic acid as an anæsthetic. This was not a mere inadvertence, but I did not desire to draw a distinction until it became plainly apparent. We now may see that, if I am correct, the two states are not identical. In fact, their nearest resemblance is that both are conditions of insensibility; but on the same grounds a club may be denominated an anæsthetic, for its vigorous application will induce unconsciousness. We are then ready for a new definition, and an anæsthetic may now be denominated an agent which, existing in the blood in sufficient quantities, will produce insensibility to pain and yet whose presence in such quantities is not incompatible with a continued existence. An asphyxiating agent is one which, while inducing entire unconsciousness, is incompatible with life. Now, as these two conditions are attended by the same physical symptoms, and are yet so widely variant, it would appear that they must be induced by different means. As asphyxia is demonstrably a change in the blood-corpuscle, it would seem that anæsthesia is due to some profound and specific effect produced directly by the agent itself.

Herein the conclusions which I have reached are directly opposed to those of Snow, Sansom, Anstie, and most modern physiologists, who believe both asphyxia and anæsthesia to be due to a modified neural nutrition.

Let us look at the matter from another standpoint. I have spoken of the changes wrought in the hue of the blood both in asphyxia and anæsthesia, but it is now time to say that the alterations in color are not due to the appearance of either oxygen, carbonic acid, or any other agent. The changes are *induced* by them, but the diversity in color is merely one of form. Whatever tends to distend the corpuscles darkens the blood, owing to a change in its refractive powers, and the converse of this is also true. Thus carbonic acid distends the disks, carbonic oxide contracts them. Ether distends, and chloroform empties them, and accordingly under the influence of the former the blood becomes darker, while the latter makes it lighter in color. It is thus seen that changes in hue are not necessarily indicative of either the presence or absence of oxygen. It does not seem reasonable that the profound effects of anæsthesia are produced simply by a change in the *form* of the blood-disks. It cannot well be a lack of oxygen, for that is simply asphyxia. We must, then, come to the conclusion that the presence of the anæsthetic agent, as carried by the blood-corpuscle, does produce a profound impression directly upon nerve tissue, paralyzing it for the time, and making it incompetent to perform its proper functions.

This would seem to be the case, too, when we take into consideration the manner of progression of anæsthesia, which is from the extremities toward the central ganglions of the nerves. Anæsthetics also paralyze none but the sensory nerves. In both these characteristics it is the direct opposite of woorari, which affects only the motor nerves, while its progression is from the center toward the peripheries. These facts, too, seem inconsistent with the theory that anæsthetics produce their characteristic effects solely by the change in the nutrition of the anatomical elements of nerve-tissue. Rather does it appear probable that their action is the invasion of a resistless enemy which, primarily attacking the outposts, where indeed it is first brought in contact with the filamental tissue, in its onward march lays its icy hand successively upon the delicate nerves, and rocks them in oblivion. Just what this power is, or in what peculiar manner it is exerted, we know not. We can study it only in the phenomena which it presents.

There are certain vegetable organisms which exhibit functions analogous to those of the nervous system of the animal world. The so-called sensitive plant presents a kind of embryonic or protoplasmic tissue which performs the physiological office of true nerve structure.

It is as easily anæsthetized as an animal, and presents analogous phenomena when in an anæsthetic state.

Another reason why it seems to me incredible that anæsthesia is produced through a change in nutrition, is the fact that its agents affect nervous force when ordinary function and blood-circulation has ceased.

EXPERIMENT 10.—Remove the whole upper portion of the head of a frog, including cerebrum and cerebellum; open the thorax, take out the heart and lungs and cut off the extremities, leaving only the upper part of the alimentary canal. Two or three may be prepared in this way, when a smooth glass rod is thrust through each digestive canal, and its ends placed upon steady supports. It will now be found that the remaining portion of the frog will slowly travel along the glass rod, impelled by the vermicular motion of the œsophagus, and intestine, and the ciliary motion of the larynx. But if a bell-glass be put over one of the frogs, and a sponge wet with chloroform be placed within it, this motion either ceases entirely or is materially retarded.

Surely this cannot be from any change in the blood-corpuscles, for their movements have ceased. But there is a persistence of nerve function, especially in cold-blooded animals, which does not cease when other functions are lost, but which, true to its law, is suspended by anæsthesia.

It seems to me unreasonable to suppose that anæsthetics should produce their characteristic effects through an altered nerve-nutrition, when we remember how instantaneous is nerve-action. Entire loss of sensation may be the result of a simple external nervous impression, as by fright, or shock; and this not through syncope, though an impression may be wrought through any of the senses which shall entirely suspend sensibility by means of a syncope,—itself merely the effect of a nervous impression. The sight of blood, the hearing of unwelcome news, the touch of a loathsome object, the taste of peculiarly unpleasant substances, or the memories revived through a penetrating odor, may instantaneously deprive a highly-wrought nervous organization of sensation, and induce complete syncope. Shall we say that these impressions are produced by an altered nutrition? It seems much more credible that they are the effect of direct shocks to the terminal nervous filaments themselves.

I now believe that I have produced sufficient testimony to justify me in seriously questioning the correctness of the conclusions of Anstie, Sansom, Snow, Duroy, Lallemand, and others, that anæsthesia is due to an alteration in the blood-corpuscles, or to a changed nutrition.

There are some phenomena presented in the action of the more common anæsthetics which are at least peculiar. While they all affect the sensory nerves alike, or produce the same general phenom-

ena, their reflex effects upon the motor system and upon volition are widely variant. Chloroform and ether produce entire muscular relaxation. Nitrous oxide usually does so, but the administration of most of the other agents produces spasms, either tonic or clonic. At least this has been my own experience. Bromide of ethyl I have known to induce spasmodic action almost like that peculiar to strychnine poisoning.

Why is there almost an entire immunity from danger when chloroform is used in parturition? It would seem as if this agent were expressly intended for such occasions. There are analogous phenomena in alcoholism, as in the immunity from the effects of certain poisons which inebriates possess. These unusual phenomena can only be explained by supposing that nervous tissue is then in such a condition that it is no longer amenable to the profound direct impressions of the anæsthetic or toxicological agents.

Other reasons might be advanced for the faith that is in me concerning the physiology of anæsthesia, but they would be but a rehearsal of what has been better said by others, and I forbear. It appears to me that in this direction lies a wide field for scientific exploration. The speculations of late physiologists have, so far as I am concerned, but served to befog the whole matter. What the character of nerve-force is no man can say. It resembles electricity, but manifestly it is not that energy. That there is an impetus and flow to the mysterious impulse seems demonstrated, and its velocity has been measured, and found in man to be about two hundred and fifty feet per second, while in frogs it is about eighty. This rate of progression alone proves that it is quite distinct from electricity, even were it not true that there is in the nerves no such thing as a closed circuit, and that the mere injury to a nerve-filament stops the current, although there may be no solution of continuity. Neither can nervous force be accounted for on the hypothesis of chemical action, any more than by the supposition of the ancients that the nerves were hollow tubes through which flowed a nervous fluid. The whole subject is a mystery, even to the actual office of the nerves, for they are not essential to life, unless we except those which preside over involuntary muscular action, and the severing of these is only fatal after considerable time has elapsed.

EXPERIMENT 11.—Anæsthetize a dog and sever both pneumogastric nerves. It will be found that almost immediately the breathing and the heart-pulsations become irregular, at first increasing in frequency, but later becoming much retarded. The animal will exist for some days, and will finally die from other complications than the direct stoppage of the heart through want of nerve impetus.

That irritation of a nerve acts as a stimulus and sends some kind of

an impulse along its course, we know; and that certain drugs, acting through other organs, produce a decided effect, either of stimulation or sedation, we also know. That there must exist a functional harmony in the system, so that increased muscular exertion will be at once provocative of an increased blood supply, is an evident fact, and it seems to be the office of the nerves to preserve this balance. When we are able to comprehend the character of this nervous force we shall better understand the therapeutical action of anæsthetics; and it seems to me that this very study of neurosis and neurotics is the paramount physiological and pathological question of the day.

ANÆSTHETICS.

The relative safety of the most commonly employed anæsthetics has been much discussed, and this goodly city of Boston has led the way in the indiscriminate denunciation of one agent as always unsafe, and the commendation of another as comparatively harmless. It must have been a model professional coroner's jury which arrived at this sage conclusion. That we cannot with impunity so far interfere with a normal existence as to suspend some of the most important functions of life must be apparent to all. But the average student desires to know if there are degrees in the risk to be run, and if so, which offers the least peril. For all practical purposes we may ignore all anæsthetic agents save chloroform, ether, and nitrous oxide gas. A long series of experiments, closely observed for the purpose of obtaining illumination on this point, has failed to show any definite reason why one agent should be always chosen to the exclusion of others. At one time an experiment, repeatedly tried with the same results, pointed to a marked difference in certain physiological effects upon cardiac tissue in the administration of chloroform and ether, and I was fondly of the opinion that we stood upon the verge of a grand discovery. But another series, undertaken to fortify the ground I was about to assume and to make assurance doubly sure, overthrew my inchoate theory and again impressed upon my mind the fact that Truth does not reveal herself hastily to the experimental novice. The record of observations was thrown away, and I commenced back again.

The progression of anæsthesia is gradual. It does not overwhelm the whole nervous system at once, but it conquers by detail, and this seems to be the order of its resistless attack upon the great nervous centers:

First—The cerebral hemispheres.

Second—The spinal cord.

Third—The general ganglionic system.

Fourth—The respiratory ganglia.

Each of the agents exhibits certain characteristic phenomena in its action, yet all follow the same general law. Certain definite quantities of any toxicological agent may be tolerated by the human economy, but that point once reached and passed, the peril commences. Were this point of danger a definitely fixed one, we might know when it was approached and avoid exceeding it, but the line of safety depends greatly upon modifying circumstances. During digestion relatively large quantities of any poison may be ingested with impunity. A freshly-fed dog will endure a quantity of woorari that would be speedily fatal to one which was fasting. In producing narcosis we usually desire to anæsthetize the whole nervous system save that which presides over involuntary motion. The danger consists in going too far, and lest the point of safety be overreached, common prudence bids us proceed with caution. Air impregnated with deleterious gases may be inhaled, provided the proportion be not too great. Carbonic acid gas always exists in the atmosphere, and unless the proportion exceed two or three per cent. it is harmless. Even as high as five or six per cent. is not specially injurious to the person accustomed to its inhalation, and Berzelius says that a man will live for some time in an atmosphere containing thirty per cent. of carbonic acid. Of carbonic oxide one per cent. is injurious, and can be inhaled for but a short time. Chlorine may be breathed in small quantities with impunity, notwithstanding the well-known acrid qualities of that gas. We see, then, that any gas may be so largely diluted with air as to fail to produce its toxicological effects. But there is a proportion beyond which we cannot go in the inhalation of any gas or vapor which will not support life. Exhaustive experiments have abundantly proved that not more than five per cent. of chloroform or ether can be breathed without extreme danger, and the observations of Lallemand, Perrin, and Duroy have demonstrated that an atmosphere of eight per cent. of chloroform is fatal, while two per cent. can be breathed a long time without inducing the anæsthetic state. That the great danger in the administration of any anæsthetic lies in allowing the patient to breathe an atmosphere too highly charged with the vapor is incontestably proved, and it must be accepted as a fact. I have not the time to enter into a further discussion of this subject, or to adduce the volumes of proof which are at hand, but the truth of the assertion is not disputed among experts in the administration of ether and chloroform. In the usual methods of giving these vapors a patient may easily be made to breathe an atmosphere of ten or even twelve per cent. What is the inference? *These agents should never be employed without the aid of an inhaler which may be implicitly depended upon to properly dilute the vapor.* In the use of nitrous oxide safety

lies in withdrawing it before narcosis shall have proceeded too far.

In the use of chloroform, ether, and nitrous oxide there is a certain train of symptoms, each following the other with considerable regularity, but not, in the several agents, with the same degree of intensity. The first stage of anæsthesia is one of hyperæsthesia and excitement. There is an increased flow of blood through an accelerated action of the heart, and a dilatation of the capillaries, with contraction of the iris. This is especially marked in exhibitions of chloroform, and during its administration the excitement or hyperæsthetic stage is sometimes very violent; and it is at this time that the danger is particularly imminent in cases of lesions of the heart. Under the stimulus of the great sympathetic, if the muscular tissue of the heart be weakened by fatty degeneration, or if there be marked diminution of its left ventricular capacity, its spasmodic struggles may result in an embolism when, as is usually the case, the muscular coats of the arteries are weakened through the irregular action of the heart, or that organ may itself become paralyzed through its extraordinary efforts to respond to the exertion demanded. Death then occurs either through spasm of the heart, or paralysis of the sympathetic nerve. The most reliable statistics show that more deaths occur at this stage of chloroformism than at any other, and I never heard of such an unfortunate termination in which the agent was not pushed beyond the bounds of prudence in allowing an atmosphere too heavily charged with the vapor.

Another symptom attending this stage, or immediately preceding it, is the choking sensation, or feeling of suffocation, attended frequently with violent coughing and spasmodic struggles for air,—another indication that the vapor is not sufficiently diluted. These symptoms may arise from two causes. I have in the first part of this paper shown that chloroform and ether modify the ability of the blood-corpuscle to absorb oxygen, and if the atmosphere be too highly charged with the vapor of either, the medulla soon manifests its imperative needs by spasmodic struggles for breath and by symptoms of asphyxia. The coughing arises from irritation of the terminal filaments of the glosso-pharyngeal nerve, as is proved by the loss of taste, and by the fact that if tracheotomy be performed and the vapor introduced through the tracheal tube, no such symptoms are ever observed. Any of you who have experimented with animals when the nozzle of a bellows was introduced into the trachea for the purpose of artificial respiration, and have anæsthetized the animal by means of a sponge applied to the valve, must have noticed this.

The next physiological sign in narcosis is contraction of the arteries, due to a still more profound impression upon the vaso-motor

system, and the beginning of the loss of sensation in the extremities, as indicated by a tingling feeling in the fingers and toes, which gradually extends toward the vital organs.

If the excitement stage be once safely passed, chloroform narcosis proceeds quietly until the sensory nerves of the cerebro-spinal system are quite paralyzed, and if it be not pushed too far, the danger is very remote. If chloroform be properly administered and closely watched, it is not as dangerous as has often been represented; but its exhibition *absolutely demands* the services of a skilled expert, for as it is more powerful than any of the other agents, it requires greater care on the part of the administrator. Especially should the iris of the eye be closely watched, for though in its later stages the pupil is expanded, caution must be observed that the total relaxation of coma be not approached. The danger is chiefly during the excitement stage, and then it is usually the result of want of prudence in allowing too great a proportion of the vapor.

In ether narcosis the excitement period is seldom attended with such violence as with chloroform, and hence there is less danger at this time, for the instances in which ether has proved fatal through paralysis of the heart are very rare indeed, if they exist at all. In all cases of death from ether of which I have any knowledge, the heart has pulsed some time after the cessation of breathing, but with chloroform it is the reverse. Ether, like chloroform, first stimulates the heart, but it does not seriously depress it afterward. The great danger in the administration of this anæsthetic is from the arrest of respiration, and this is due either to a paralysis of the sympathetic, or more often to the filling-up of the smaller bronchi by mucus, through the destruction of the sensibility of the membrane lining them, and the consequent cessation of the ciliary motion of the villi, which carries the mucus forward until expectoration can remove it. In nearly all cases of death from ether it will be found that bronchial râles and stertorous breathing precede death, the latter symptom being due to paralysis of the pharynx. By the expert the unfavorable symptoms from chloroform may be earlier and more surely detected than can those from ether.

The progress of narcosis, according to Anstie, is in its effects manifested—

First—Upon the cerebral hemispheres.

Second—Upon the cerebellum.

Third—Upon the medulla oblongata.

And the narcotized individual will lose—

First—Local sensibility in the extremities.

Second—The intellectual powers.

Third—The general power of co-ordination.

Fourth—Power of receiving sensory impressions.

Fifth—Power of breathing.

Sixth—Involuntary muscular action.

There seems to be, also, a general progress of anæsthesia through the cerebral nerves from the anterior portion of the brain posteriorly, for the first sense which is lost is that of smell, as is demonstrated by the usual demand for more of the agent, and this demonstrates a partial paralysis of the first pair of nerves. This phenomenon is readily accounted for by the fact that the anæsthetic reaches the terminal filaments of the olfactory nerves before it is presented to those of any other, and is an additional argument in favor of the theory that anæsthetic effects are produced by a direct impression upon nerve filaments. After the loss of smell comes loss of sight, loss of ability to control some of the muscles of the eye, and an enlargement of the pupil, owing to paralysis of the ciliary and recti muscles, which indicates the overcoming of the third, fourth, and sixth pairs of nerves. About this time follows loss of sensation in the integument of the face and eyelids, of the muscles of the tongue and of the teeth, indicating paresis of the fifth. This is followed by loss of the expression of the face, and of hearing, denoting a paralysis of communicating nerves of the seventh and of the eighth, while the tenth, eleventh, and twelfth pairs of cranial nerves are the last to succumb.

Of nitrous oxide and the bromide of ethyl, time forbids me to speak extendedly. The first, the especial refuge of quacks, is of use only in brief operations, like the extraction of single teeth and the opening of abscesses. With the last my own experience has been anything but pleasing. In its administration to the lower animals, clonic spasms, sometimes of a very violent character, have induced too great a distrust of its safety to warrant me in giving it to human beings. There are many other things of which I would be glad to speak, and many experiments and vivisections which I have made, especially some illustrating modifications in the circulation of the blood, which I would desire to relate, but I spare you the recital.

My own experiments and observations in the use of chloroform and ether would lead me to use especial caution, in case of the former, to see that there had been no indication of weakened heart's action, as exhibited by fainting and dyspnoea; to use especial caution with those addicted to the use of alcohol, and to be particularly careful to give thorough dilution of the vapor until the excitement stage be passed. Finally, to carefully watch the later stages of anæsthesia, and to suspend the administration at the first indication of any excessive dilatation of the pupil, of stertorous breathing, or of relaxation of the muscles of mastication, as these are governed by nerves which arise from the medulla, and indicate danger to the sympathetic system.

In ether narcosis, instead of watching so carefully the action of the heart and the pulse, I pay particular attention to the respiration, and at the very first appearance of bronchial râles I suspend the administration. In case of the persistence of unpleasant symptoms from chloroform, the utmost exertion should be put forth to stimulate the heart to action, such as the administration of arterial stimulants, electric currents, and nerve shocks. If the danger occurs in ether narcosis, pay little attention to the heart or pulse, but commence artificial respiration, and persist in it until long after hope shall have almost fled. Several instances are on record where artificial respiration, after the methods recommended by Marshall Hall or Dr. Silvester, has resulted in recovery long after the patient had been pronounced irrecoverably dead. In both cases keep up the temperature by artificial heat. Many a life has been lost which might have been saved only for allowing the temperature to be reduced by the subsidence of functional activity. In any case, a cool head and the possession of all your faculties, with perseverance in the use of restorative measures, will enable you to overcome the most determinedly adverse symptoms, and prove you worthy to be trusted in the gravest complications.

THE UNWRITTEN LAW OF DENTAL ETHICS.

BY C. A. MARVIN, BROOKLYN, N. Y.

(Read before the American Dental Association, at Boston, August 6, 1880.)

ALMOST every dental society has its code of ethics,—more or less elaborate, more or less stringent. It is incorporated in the printed by-laws, and provision is made in the same laws for the prosecution and punishment of any and all who are charged with the infraction of said code and are found guilty.

As the code of ethics which governs any society has been adopted by the same vote as that by which the other laws were enacted, it follows that as the general by-laws are the formulated views of the members as to government and procedure when in convention assembled, so the code of ethics must be taken as the formulated expression of the same membership as to what constitutes consistent, honorable, professional conduct. Ethics is a system of morals, and, strange as it may appear, it is deemed important, nay, necessary, to put into words—actual words—the rules which should govern honorable gentlemen in their intercourse with each other and with the public. It is not considered safe, let it be observed, to leave such intercourse to be governed by the natural instincts of the gentlemen themselves. It is not intended to comment on this necessity, or felt necessity, but merely to state the fact.

Just here a nice question might be propounded, viz., Whether the fixing of certain rigid rules of conduct insures as high-toned and exemplary demeanor as the operation of the principles of honor and integrity when left to work out their own natural result without restraint of law? When a code is made, observance of the letter of the code is all that is required. The principle beneath is hidden. May not the attention be so engrossed by the prescribed rules continually set before us that all thought of that principle beneath is precluded? Indeed, may there not be an absolute disregard of the existence of any principle there whatever?

Leaving the two thoughts just suggested for any gentleman to meditate upon if he so desires, I pass on to the immediate object of this paper, which is to call attention to the ethical principle which should govern professional action at all times, and to the ease in which it *may be* (shall I say it *is*?) violated without coming in conflict with the written code and incurring its penalties.

The fundamental principle of our code of ethics is, a courteous regard, on the part of every dentist, for the rights, the feelings, the reputation, and the interests of every other dentist; also for the dignity of the profession itself. Anything that is in any wise adverse to this principle is an infraction of ethics, whether the code specifies the particular act or not.

It is deemed unprofessional, for instance, to advertise one's self, and it is so stated in the written law; but may not expedients almost numberless be resorted to to accomplish this very end? I mean other than the proper participation in public discussion of professional questions or writing for journals. These are appropriate, are expected, are incumbent upon practitioners.

Now, it is not held in this paper that it is improper in a professional man to make himself known in the community. It is right. It is his duty. He owes it to himself and his family. But there is a proper way to do it. It is more becomingly done by letting his light shine out, as light streams forth from the windows of a brilliantly-illuminated house, than to make a forced parade of it. People understand quite as quickly that there is a light within the house as they would were a bonfire built in front of it and a bell rung to call them to look at it. So the ability that will not stay imprisoned within a man, but displays itself by reason of its own diffusive nature, must command attention and win favor more hearty, more enduring, than when egotistically paraded by the owner. Indeed, its genuineness in the latter case is often doubted, and with reason. It is not necessary, for instance, that special attention should be invited to the particular degree one is entitled to affix to his name, nor that a comparison be instituted between it and that which has been conferred upon some

other man. The degrees are not affected by such boastful talk, but the speaker is, and, in the minds of sensible persons, not at all in the direction he intended. Such violations of the spirit of ethics are not entirely unknown.

Again, when in speaking of certain departments of dental practice which the speaker pursues, allusion is made to some other practitioner who omits some one of these in his practice, and the omission is held up as an evidence of lack of attainment or proficiency, a violation of the spirit of ethics is committed. One's own kind of practice can be made matter of conversation properly, and one's ideas as to the comparative value of departments may be expressed with propriety, and one's views as to general or special practice may be given freely, and no offense against propriety be committed. The offense consists in the disparaging comparison of another with one's self; in so shaping the conversation that self shall be exalted, and not only so, but exalted *at the expense of that other*. This is unethical; this is dishonorable. Is it ever done?

The success, however, of such a course is short-lived. The public will learn what dentist is reliable in the department of prevention of decay; of the arrest of decay; of saving greatly weakened teeth; of restoring to usefulness wrecked teeth; of correcting irregularities; of treating oral diseases; of constructing artificial dentures; and if this information is gained through others and not through the practitioner himself he stands much higher in consequence. In service as important, as publicly known as dental service, the injunction in the old adage becomes inevitably a statement of fact, for "every tub" *will* "stand on its own bottom."

The *spirit* of ethics is very wide-reaching in extent, and capable, if truly appreciated and obeyed, of working a revolution of no insignificant dimensions in dental action.

It has been noticed possibly that in our profession, as in others of a scientific character, there is not an *entire* want of superciliousness on the part of advanced men towards men of less attainment. Neither is there any *excess* of the disposition to encourage young practitioners, timid speakers, earnest but not yet profound thinkers.

On the contrary, has there not been seen a disposition to tower above, and in the confidence which experience has given, to overawe these diffident brethren by loud tones and high-sounding phrases?

If this is so, not only is the spirit of true ethics violated, but an evil is quite likely to ensue of wider extent and more baleful nature than may at first thought be perceived.

If the timid brother's feelings are wounded and his voice silenced, his ethical rights have been infringed and the principle which should

govern professional intercourse has been as truly violated as though some written article of the adopted code were broken.

Besides this, there is sustained a loss on the part of the society,—the loss of that brother's *true* views. He will, if inclined or urged to speak, either conform his views to those of his assumed superior to avoid criticism and win his favor; or, if honest enough to hold his own opinions and to decline to accept, on statement, those which clash with them, he will keep his seat and preserve silence. His mind will not cease its operation, however, so that, like the owl, though silent, he will keep up considerable of a thinking. But *what* he thinks, however useful and interesting it might be, will not be likely to be known. Hence a loss to him and to his society.

The phase of ethics which we are considering has two sides, and to be fair we must look at both. If it is unethical to criticise rudely the diffident brother who is doing the best he can, it is quite as much so for any one, strong or weak, bold or diffident, to occupy time when he has nothing to say, or compel gentlemen to listen while he utters in a hesitating and stumbling manner crude, half-formed opinions which distress but do not edify his hearers. So that, while the leading members of a society should encourage the more retiring to take part in the business of the meetings, these should *prepare* themselves for such participation, that what they do may be for the benefit of some *one* or for the *general* good.

Time is valuable. Time lost can never be regained. Time well spent is time saved. Time so occupied that instruction is gained is time well spent. Time consumed in uttering meaningless words is time wasted.

From these axioms the inference respecting our duty is inevitable. Ethically considered, it is our duty, each one of us, to avoid whatever would cause loss to another. If I waste time which another might use to advantage, I defraud somebody. If I claim the attention of gentlemen while I speak nonsense, or speak wandringly, or impertinently, or tediously, I defraud many, and as the fundamental principle of all ethics is regard for others' rights, I commit a breach of the great, wide-reaching, unwritten law which is my text to-day.

Perhaps we have not thought as much of this as we ought. It is a truth generally very little considered by men when gathered in convention, to say nothing of other times. It should be considered and should be observed, and its consideration and observance would accomplish good. It would not, as might be hastily concluded, discourage debate, but would make it more pointed and practical. It might reduce the number of words spoken, but would not damage the ideas presented. It would insure the *possession* of ideas by every one who should claim the attention of the assembly.

It would stimulate the habit of rigid thought and educate a man to refine his ideas in the glowing fires of his mental furnace, that the real substance may be perceived, its dross burned away. Crude ideas are better than no ideas; but when sufficient time has been taken to *mature* such ideas, before presenting them for the reception of hearers, it is better still. Crudeness may be amusing at times, but is not gratifying. It is often tolerated from a sentiment of good-nature, or because an immediate response to an unexpected call has afforded no time for maturing one's views, but the manifest expression of distress resting upon the countenances of the audience shows how little they are gratified. And when at such times a speaker insists upon holding the floor, and compels his hearers to be the unwilling spectators of his terrible struggle with a half-delivered thought that rebels against being born, and then repeats the painful exhibition again and again, who is edified? Edified! Who is not the rather rasped to an every-fiber-searching shiver? Who has not felt that the full time had come for some Berghian champion of human comfort to arise and prevent further cruelty?

So that when raw, unformed ideas are received with any degree of favor, it is not that in such immature form they are pleasing, but because of some recognized necessity for that immaturity which calls for the indulgence of the hearers.

But it should be well understood that it is unsafe, as it is truly unethical, to *presume* upon this extension of indulgence, and neglect that study and preparation which would spare the audience a repetition of the infliction they have already suffered. They might not bear it as patiently again, hence it is unsafe; they ought not to be made to suffer it again, hence it is unethical.

The more this subject of ethics is pondered, the more clearly will it be seen to stretch itself along the course of professional action, touching it again and again, until, to the earnest gaze, it shall assume the dignity and majesty of *law*, to which conduct must conform or be faulty, rather than a pretty sentiment hung as an adornment upon the conduct and adapting itself to all its variations. A close scrutiny and a construction no stricter than the principle will easily bear, will reveal to us, in the unwritten law of ethics, an inflexible standard, whose rigid righteousness would expose, to our shame, oftentimes, much irregularity, much variance, were our conduct compared with it.

Not only are our relations with our fellow-practitioners affected by the ethical principle we are considering; our relations to our profession as a noble science, and to the public as the recipients of our service, are concerned as well. There are duties we owe to both; and where—*anywhere*—are duties there ethics has its place.

What is our duty to our profession? I have considered this question in a paper written many years ago, and shall therefore answer it very briefly at this time.

In a word, then, the dentist's duty to his profession is to maintain its dignity, to increase its efficiency, to make it honorable in the eyes of men.

Any course of action which will diminish public confidence in dentistry as a profession is a breach of duty, and every breach of duty is an infraction of the principle of ethics. Hence, poor practice, imperfect operations, unskillful treatment, wasting of time, whether resulting from carelessness or ignorance, are unethical.

Hence, extravagant boasts of the advancement which dentistry has made, not sustained by the practice of the boaster; large claims for the sufficiency of dentistry in specific cases of disease, obscure and severe, not followed by the expected success in cases actually under treatment, are unethical.

Hence, surgical operations so clumsily performed that the patient and his friends are not at all persuaded that he has fared better in the hands of the specialist than he would have done in those of the general surgeon (the result being an unfavorable opinion of dental surgery), are *unethical* as well as discreditable.

Hence, undignified deportment and a disregard of the courtesies that are expected to distinguish the professional gentleman, a clownish manner and a slangy speech, a repulsive person or a rough touch, are unethical.

Hence, profuse conversation interlarded with unnecessary scientific terms, which is so superficial that the listener gathers no information and is only puzzled by the terms and wearied by the clatter, is unethical.

Something more may, with propriety, be said in this connection.

It must not be supposed that because our patients are not dentists they are unable to weigh our conversation, or to decide very quickly whether we are talking sense or nonsense, intelligently or at random.

A free use of scientific terms will not pass for well-expressed ideas, nor redound half so much to the credit of the speaker as the simple language which conveys some useful and appreciable thought.

Dentistry is a positive science as well as a practical art, and a practical art as well as a positive science.

Abstruse philosophy, however attractive, has no value to the practitioner whose mission is to achieve palpable results. The power of reasoning is a wonderful attribute of the human mind. But of what use is reasoning except a point is aimed at, and except that point be a practical one? The work of life is to the last degree material, not ethereal. Signally so is the work of our profession, and the

dentist who would be ethically faithful to his calling in the particular of making it honorable in the eyes of men must be mindful of this fact. When he talks, let it be to express an idea. Let him cultivate the faculty of expressing his idea clearly and concisely, and when thus put forth, of letting it alone. When he reasons, let it be from a premise, accepted and demonstrable, by logical procedure, to a conclusion desirable and in advance of the starting-point. When he advises, let it be seen that he has a reason for his advice clearly defined in his own mind, and that the advice is the inevitable fruit of that reason. When he works, let his effort, whatever it be, be characterized by intelligence, by a clear purpose to attain a clearly perceived end. Such a course will do more to honor the profession in the eyes of men than fine-spun theories, vague philosophies, and sonorous phrases of empty words. Such a course will embody and illustrate the fundamental principle of true ethics.

Am I met by the inquiry, "Shall no search be made then in the regions of mystery?" "Shall nothing be said or written but that which is clearly understood?" No such interdiction can be fairly deduced from what has been said. Search? Aye, search most diligently. Penetrate as far into the regions of the unknown as your boldest foot and keenest glance can go. Enter if possible into the barred chambers of occult wisdom and possess yourselves of her choicest arcana. Enter into the inner sanctuary where the richest stores of science are concealed and lay hold of them with firmest hand. But in the exciting quest forget not to discriminate carefully between treasure and tinsel, between the solid and the superficial, between the real and the seeming. And when the search is crowned with success, come forth again, bringing your treasure with you, and lay it on the common altar. To do thus is to honor one's self and to honor the profession in whose interest the labor is undertaken. This is ethics. To do less is to defraud one's self, and by just so much to defraud the profession, and this is an infraction of the great unwritten law which we are considering.

What I am urging is the creation of a goal towards which we shall press. In our personal relations that goal is the cultivation of mutual consideration; in professional work, the highest good of those committed to our care; in professional conversation, the clear expression of positive ideas; in professional life, the maintenance of personal honor; in professional study, the securing of valuable information; in society relations, the devotion of one's best energies to the promotion of the general good; in the labor of scientific research, the exercise of that calm, persistent, wise discrimination that digs and tests, that gathers and sifts, so that golden grain and not weightless chaff may be the product.

Such is the privilege, such the duty of every intelligent man, *as a man*; of every faithful dentist, *as a dentist*; and the more steadfastly, the more vigorously, the more religiously he exercises this privilege and performs this duty, the more nearly will his life accord with the requirements and the spirit of the great *Unwritten Law of Dental Ethics*.

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR meeting held at the residence of Dr. A. L. Northrop, Tuesday evening, October 19, 1880.

President Dr. W. A. Bronson in the chair.

INCIDENTS OF OFFICE PRACTICE.

Dr. C. F. W. Bödecker. About a year ago a gentleman came to me, having broken off the mesial portion of his left upper central incisor. Within the remaining portion, which was very thin, there was a very good gold filling, situated on the labial portion of the tooth, involving the pulp-chamber, and very nearly reaching the alveolar process, but perfectly sound, though it had been inserted about eighteen years ago, by a gentleman in Chicago. The patient informed me that some years since this tooth had been very loose and painful, but within the last four or five years it had given no trouble. I thought there might be a latent abscess at the apex of the root, and I wanted to take the gold filling out to treat and refill the pulp-canal, which I concluded could not have been perfectly done, but to this the patient refused to give his consent. I then put a heavy gold screw into the tooth and restored the lost portion with gold, leaving the filling in the pulp-canal and labial portion undisturbed. About two months ago the gentleman came back to me with symptoms of an alveolar abscess over that tooth. I made an incision through the gum and alveolar process at about the apex of the root. I enlarged this opening by dressing it with cotton slightly moistened with creasote and oil of cloves, about twice or three times a week, until the root was perfectly exposed to view. At this place, which was about one-eighth of an inch from the apex, I opened into the pulp-canal, which I found imperfectly filled with gold. I then enlarged this opening of the pulp-canal, and after the removal of all the loose pieces of gold and other débris, I filled it with cotton saturated with oxychloride of zinc. I saw the patient yesterday, and found the opening of the gum very nearly closed, and the root in good condition. The tooth was not at all painful on percussion, but perfectly comfortable and serviceable.

The following paper on "Replanting Teeth," by Dr. W. Finley Thompson, of London, was then read by Dr. Bogue:

To the President and Members of the New York Odontological Society.

GENTLEMEN:—The request that I contribute something to your society upon replanting teeth—a subject lately fraught with comment from both medical and dental journals—has caused me to review the experiences given by others in connection with my own before expressing an opinion concerning it.

The theory of returning teeth to their sockets has at various epochs been brought before the profession and practically investigated, with a view to a thorough analysis of its merit; but as yet there seems to be a division of sentiment regarding it. Consequently, I shall endeavor to briefly consider, 1st, the pathological bearings of the question, and 2d, the efficacy of such a method being placed in the hands of the general practitioner; after which I shall submit to your honorable body a case in practice that has been of more than ordinary interest to the writer. I shall not enter upon the discussion of the first two sections at any great length, as my views upon these points have already been fully ventilated in a published lecture.*

Any collection of pus at the apex of a root will, unless speedily reduced, prevent the re-establishment of a returned tooth in its original position, the accumulation of morbid matter augmenting until ejection may be premised. Should the tooth, under such circumstances, be retained, it would be forced from close contact with the parietes of its socket, so as to disrupt or distend the delicately forming membrane necessary for firm union, and, while new adhesions might be set up, and an effort made for its retention, nature, after a time, would show her repudiation by complete expulsion. Hence it is now a generally understood fact by authors writing upon this subject that, in all cases requiring such treatment, drainage is an arbitrary accompaniment to the operation.

Concerning the second section, I have to say that no method ever advanced in the principles of dentistry has, while seeming to possess so many advantages, been proved to be more unreliable in careless hands; for, unless special pains be taken, this system will abort the fulfillment of any measures calculated to attain the end. Taking this view of the question, I have felt that replanting can never become popular unless practiced by members of the profession who, making it a special study, will be able to judge under what circum-

* Monthly Review of Dental Surgery, vol. viii. No. 12. DENTAL COSMOS, vol. xxii. No. 3. Johnston's Miscellany, vol. vii. No. 74.

stances a tooth should be replaced. Even then success will not crown their every effort.

Without monopolizing the valuable time of your society upon questions which I feel would be better discussed by its members, I beg—in poor atonement for the privilege of detaining you—to call attention to the diagrams illustrative of a case which I hope will not be altogether devoid of interest.

P. G. W., aged fifty-two, a gentleman of sanguine temperament, apparently of good habit, but in a condition of nervous anxiety, consulted me on October 10, 1879, concerning a superior right central incisor.

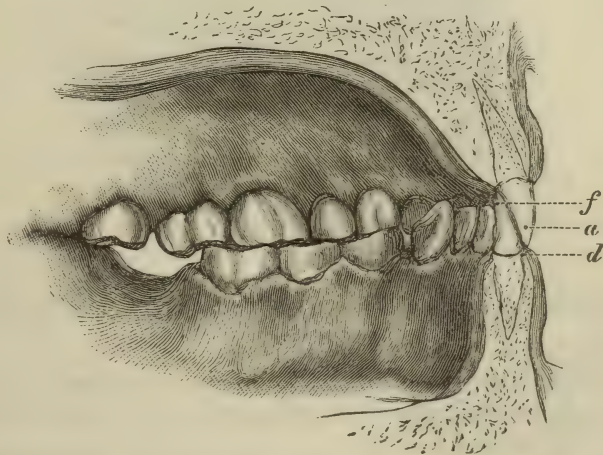
In former years he had been in the habit of forcibly closing his teeth. When awake this occurred under any strong mental excitement, and was, from some psychological phenomena, continued during sleep to such an extent that he had been frequently admonished by relatives regarding it. On examination, the mouth presented a highly feverish condition, gums hypertrophied, teeth loose, and pus exuding at the gingivæ in the superior maxilla, extending from the first bicuspid on the right side to the left canine; these and the intermediate teeth showing that they were under the influence of some special irritation of a traumatic nature.

The inferior maxilla was largely developed, square-set, and under powerful muscular control. Upon occlusion, the origin of the disease was manifestly shown to be *stridor dentium*, which had caused the loss of a considerable portion of the right superior bicuspids and canine, and the left canine of the superior maxilla; also, of the left lower bicuspids and first molar. The lower molars of the left and the second and third molars of the right side were absent. The abraded teeth were reduced to about one-third their normal height, and excavated in an ellipto-truncated form. The parallelism of the maxilla had, however, been maintained by the compensating nature of the abrasions now specified, as it permitted the lower anterior teeth to occlude aggressively upon the opposing ones, and to pass obliquely to and beyond the *linguo-gingival* border. In this the lower teeth were facilitated by the inclination of the abrasion thus produced, and also by the naturally inclined position of the lingual surfaces of the canines and incisors. Thus, by the lower centrals passing over the inner surfaces of the wasted corresponding upper teeth, and impinging on the border of the gum, it was forced far back from the cervical portion of the superior incisors and torn from its connection with the *peridental* membrane. In fact, at every closure of the mouth, the lower incisors became imbedded in the gum covering the lingual border of the superior maxilla.

The seven teeth naturally called for my first consideration, although

final treatment involved the restoration of the superior right central. The left central was also compromised by abrasion, which resulted in functional derangement of so marked a character as to ultimately require attention. The manner in which the normal articulation was restored I have endeavored to illustrate in Diagrams 1, 2, 3, and 4, representing split sections antero-posteriorly through the medial portion of the mouth, giving the linguo-palatal aspect of each, which will be better understood by the following:

FIG. 1.



a, right superior central (outlined tooth); *f*, right inferior central, with cutting edge imbedded in palato-gingival border; *d*, gum, labio-dental region, showing near approach of the superior central to it.

In Figure 2 will be seen both bicuspid and the canine in the right superior maxilla built up with gold (*b*). In Figure 1 (*a*), outlined tooth, is shown the mal-articulation, with impingement of the inferior central upon the gum. Figure 2 (*a*), outlined tooth, exhibits the original articulation restored; * indicates the tooth replanted.

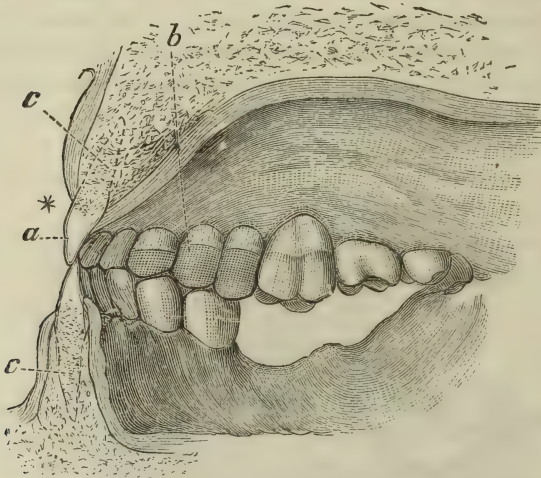
To prevent the extension of abrasion the teeth were restored to their natural length, the spaces of the missing ones being filled by artificial dentures.

Figure 3 is a second view of No. 1, showing the improved juxtaposition of the outlined tooth (*a*) with the opposing inferior central. The dotted line, *e*, indicates the extent of the previous mal-articulation, consequent upon the recovery of maxillary equidistances by the building of the right bicuspid and canine.

Figure 4 represents three teeth upon the inferior and one on the superior maxilla restored to their normal height, remedying the deficiency shown in the last figure, and supplying occluding surfaces auxiliary to the restored crowns of the teeth on the right side. In the two inferior bicuspid it became necessary to destroy the pulps.

The morbid accumulations in the alveolar chamber had forced the superior right incisor from its normal position, until it assumed a pen-

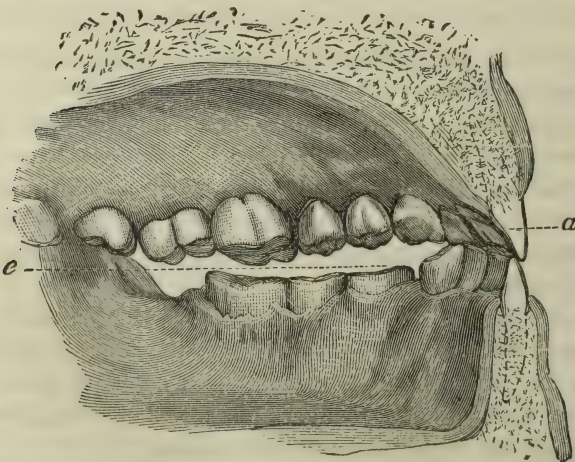
FIG. 2.



a, left superior central (outlined tooth); *b*, cross-etching denoting the extent to which the canine and bicuspid were built.

dulous mobilization, which threatened entire expulsion. The emanations from this *cul-de-sac* were discharged from the marginal border

FIG. 3.

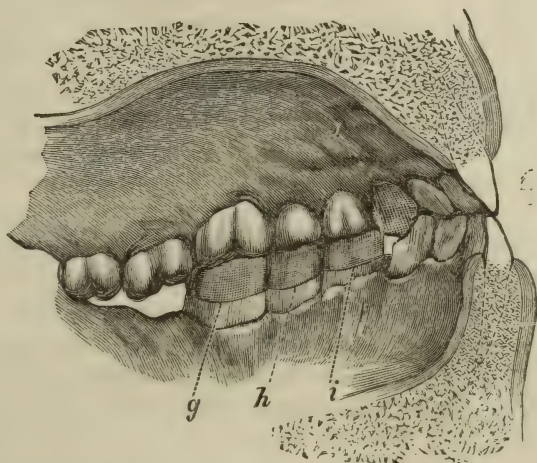


a, right superior central (outlined) shown in contradistinction to the position as formerly occupied in Figure 1; *e*, dotted line showing extent of abrasion on left side, the teeth on the right side having been built to their original contour.

of the gum, never having apparently culminated in an external parulis. The cause of this exudation might be alveolar abscess from

pulpitis, or it might arise from periodontitis simply, but examination revealed no diagnostic symptom as to which of these two conditions

FIG. 4.



g, h, i, lower bicuspid and molar restored; *j*, superior left canine, with lingual surface rebuilt.

might be the cause of suffering. At this juncture I availed myself of the kind assistance of several professional friends, but they found the same difficulty as that experienced by myself. All the teeth in the upper maxilla were abraded, but more particularly the two right bicuspid and canines, as shown in the restored articulation, Diagram 3. The abrasion on the incisors was of a different character, as it followed the incline of the lingual surface, and extended below the gum, indicating the limit of contact with the lower teeth. On the left side, the abrasion, as already stated, was principally manifested in the remaining molar and both bicuspid of the lower maxilla, the ragged edges of which proved a constant source of irritation to the tongue.

Looking at the worn surface, the outline of the pulp-cavity could be distinctly defined through the thin lamina of dentine, but no actual exposure had occurred. The patient failed to co-ordinate the jaws in a manner acceptable to his wants, and, as a means of relief, had instinctively resorted to the expedient of placing small pieces of box-wood between his teeth to prevent impingement on the gum. This trouble was fast resolving itself into mental as well as physical disturbance. There seemed to be defective energy of the whole body, and a morbid condition of the blood, arising from a diseased state of the assimilating powers.

The immediate inducing cause of the patient's visit was pain in the right superior central incisor upon occlusion of the teeth; and

this was of so serious a nature that he was frequently awakened from his sleep. Although extensive abrasion had taken place, there was nothing to lead me to suppose that the tooth was not alive, further than the elongated condition, in connection with the exuding pus, which was the evidence of an abscess, the tooth appearing healthy in color, and with no opacity, evinced by the diffractive test when passing a glass posterior to the lingual walls of the tooth.

My diagnosis not being satisfactory, I resolved not to operate at once, but made another appointment, postponing any course of treatment, and reserving the case for further consideration and investigation.

At the second visit of the patient, October 13, the disease having concentrated itself upon the right superior central, I determined, first, to open the pulp-chamber, that treatment might be effected through the nerve-canal in connection with remedies externally applied; and, second, to build up the teeth with gold until the original articulation was restored, in order to relieve the anterior teeth from pressure.

The signs of disturbance led me to believe it a case of pulpitis, notwithstanding the indications of *vis vite* presented by the tooth itself. The pathognomonic symptoms of acute disease in its surroundings had deceived me; for, upon opening into the pulp-chamber, my diagnosis proved to be incorrect. However, my exploration, although executed under the guidance of mistaken impressions, was a cause for no lament, as all efforts to effect a cure from treatment in the mouth proved abortive, even when the medicinal remedies were directed to the seat of functional derangement by injection through the apical foramen of the root.

The cause being a cystic formation over the peridental membrane, instead of at the apical portion of the tooth, rendered a perfect comprehension of the case more difficult. This formation was one of the consequences of direct mechanical injury inflicted on the enveloping membrane by the impingement of the lower teeth upon the gum, as already described. That the pulp had preserved its integrity, and that the slender filament or twig of the trigeminus should have retained its vitality through such an ordeal, seemed very remarkable.

I then began a vigorous course of treatment, using all the (to me) known remedies applicable to the case. This was uninterruptedly and faithfully pursued for a period extending over three months. The disease alternated from mild to more severe and aggravated forms, but at no time did the exudation of morbid matter cease.

Every effort to control the disease having proved futile, I a second time availed myself of the privilege of consultation, which resulted,

however, in no proposal of different treatment from that which had already been pursued.

The long-continued and obstinate resistance to every measure adopted caused the prognosis to be very doubtful. I then began seriously to entertain the idea of removing the tooth and replanting it. Nevertheless, I contemplated this operation with but very little faith, owing to the extended and destructive inflammation manifestly existing in the peridental membrane. The very means on which I built my hope of success was undermined by the seriously compromised condition of this membrane, for the integrity of at least the major portion must exist where replanting is resorted to. Although inflammation may so involve the covering membrane of the root that its partial destruction is predicted, its loss is not a necessary sequence. The pathological condition of the tooth now under consideration was such as to destroy confidence in any method which, under other circumstances, might have resulted favorably.

Disease had so long preyed upon the tooth and adjacent tissues that the employment of remedial measures in the mouth had proved detrimental rather than beneficial. Further delay in operating, however, only jeopardized the chances of success. Consequently, the tooth was removed, and a condition of disease found to exist as pictured in Figures 5, 6, and 7.

FIG. 5.



FIG. 6.

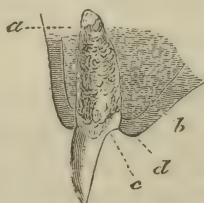
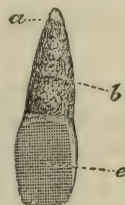


FIG. 7.



aaa, points of denudation,—labial, mesial, and lingual; *bbb*, points at which the disease seemed concentrated; *c*, abraded surface of central; *d*, condition of gum from concussion; *e*, restoration with gold, lingual surface.

A tenacious cystic formation had diffused itself over the entire surface of the peridental membrane. Pursuing the general tendency of the disease to concentrate itself on the labial surface, it was here that the maximum state of the denudation seemed to manifest itself, gradually diminishing until the minimum dimension was attained on the lingual side, making necessary an oblique conoidal shape of the cap afterwards adjusted to the root. Referring to Figures 5, 6, and 7, will be seen morbid conditions as manifested upon the labial, mesial, and lingual aspects of the root, denudation at the apex being shown at *a* in each of the figures. The pseudo-membrane possessed

sufficient structure to make actual dissection necessary in separating it from the pericementum. It will be observed, by reference to each of the figures, that its tendency was to focus in the vicinity of the labio-cervical region, *b*, Figure 5. In Figure 6 is shown a side-view of the abraded central, the almost cycloidal surface of which offered no resistance to the occluding teeth, but rather guided them to hostile contact with the gum. Figure 7 shows the lingual aspect, the lost parts having been restored with gold. The root being reserved to illustrate the positions of disease, the cap, which is a concomitant of the crown filling, is not shown.

Following the removal of the pseudo-membrane, that portion of the root on which denudation had taken place was excised, and the tooth thoroughly disinfected. It was then tubed and capped, under the ordinary conditions as prescribed when operating in this method. (See journals already quoted.)

Concluding my remarks upon this case, I may say that it has been repeatedly inspected by others of the profession, and, to their surprise, as well as my own, the replanted tooth is the only perfectly firm tooth in the head, there being neither discoloration of the tooth nor recession of the gum. The left central has since given trouble, and been treated in the mouth up to this period with very indifferent success.

An over-zealous attempt to secure immobility during the formation of the new adhesions may result in failure, as the most promising and rapid evidence of convalescence frequently terminates in death of the membrane, excessive ligation being very likely to cause vascular strangulation.

In regard to the indications as to when and under what circumstances treatment by replanting should be adopted, I can only say that I consider it a *dernier ressort*, and only justifiable when a tooth is so complicated with disease as to make other treatment doubtful, or, perhaps, extend over such a length of time, upon an uncertain hope, as to cause a quicker method to be more acceptable. My earnest conviction regarding it is that, where due precautionary measures are observed, great benefit will accrue in cases difficult of treatment in the mouth; yet I most unhesitatingly pronounce it uncertain and attended with but little profit, where complications in disease are not strictly observed in the therapeutic measures adopted.

Up to the present time I have left the value of the method pursued by myself an open question for the profession to decide. I think, however, that after eighteen months of careful investigation and observation, I am justified in saying that when teeth are replanted there is no absolute certainty of immediate union taking place, unless a conduit is effected independently of surrounding

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structures; and this cannot be accomplished by any system of drainage external to the root without injury and loss of tissue upon which the tooth, in its pulpless condition, is wholly dependent for its low vitality.

As to the efficacy of the cap in arresting absorption, I will only add that I have seen nothing to lead me to believe it impracticable, no instance having come under my notice in which trouble was the result of its adoption; but until further tested I must reserve an opinion concerning it.

The following communication from Dr. Barrett, of Buffalo, was then read:

"No. 11 WEST CHIPPEWA ST., BUFFALO, N. Y., Oct. 12, 1880.

"DR. C. E. FRANCIS, Cor. Sec. Odontological Soc.

"*Dear Sir:* I am in receipt of the regular call for the October meeting. As it is impossible for me to be present at that time, will you allow me to indicate my warm interest in the Society and the subject for consideration, by saying through you what I might tell by word of mouth had I the opportunity?

"Of *transplantation* I know very little, and shall say less. But with *replantation* I have had some experience.

"The violent separation of tissues, and their subsequent conjunction with a view to an improved pathological condition, would seem at first sight an utter absurdity; but, when more closely examined, there appears to be a method in the madness. I can conceive of two conditions in which extraction and replantation would be indicated, and but two.

"*First.* When for a long time there has existed a chronic state of periosteal or other inflammation, which usual methods and medications will not cure, we may resort to this expedient.

"It is sometimes considered good surgery to violently break up existing conditions, and by means of a trauma to induce metaplasia, by which an acute stage, tending towards recovery, shall supplant the chronic one.

"*Second.* When a portion of the tissue of a tooth or of its immediate environment has retrograded sufficiently to forbid its return to functional activity, and when this tissue is so far beneath the surface or in such relation that it can be reached for amputation or removal by no other ready means, we are, I think, quite justified in extracting the tooth, performing the operation, and then attempting its return. As a distinguished and venerated member of this society forcibly insists, 'Half a loaf is better than no bread,' and when we cannot save the whole of either a tooth or its pulp, we are not in duty bound to sacrifice what is left. But in either of these instances

extraction is a *dernier ressort*, only to be attempted in extreme cases and when other available means have failed.

"Narratives are not arguments, nor are isolated cases proofs of anything, save, perhaps, casual success despite a most villainous course of treatment. A cause that is buttressed by nothing but long and equivocal tales concerning individual cases is a weak one; yet, in spite of this impeached and tainted kind of testimony, I have an unconquerable itching to make use of it and relate an instance in point in my own practice.

"Twelve years ago Miss H., a rapidly-growing young girl, had the softest and most porous teeth which it was ever my ill-fortune to encounter. (There has since been a marked change in their physical characteristics, by the way.) I could penetrate the enamel with an excavator at almost any point, and at the cervical portions most of them cut like new cheese. She was then about thirteen years of age; her attention had not previously been directed to her teeth, and they had consequently been greatly neglected. In spite of this, all of the twenty-eight were present, and none presented symptoms of compound caries save a lower bicuspid. I filled all the cavities with gold,—a bad material for such cases, say the *puttyists*,—with the exception of this bicuspid, whose exposed pulp I capped, filling the cavity with oxychloride of zinc, enjoining her to present herself for examination in three months. I did not see her again for three years, when I found a dead pulp, and, as she was then on her way to boarding-school, I cleaned it out, inserted a pulp-dressing, and placed her in charge of a brother-dentist in the place where she was to remain. The tooth was subsequently filled without sufficient treatment, and when, two years afterwards, she presented herself at my door, pus was exuding all about the neck of the tooth, and the now fastidious and refined young lady insisted upon its removal. After long hesitation and serious ponderment it was extracted, and I found characteristic pus erosions involving about one-third of the root. This was amputated, and the new apex was rounded and nicely polished. The root-filling was now removed and the canal filled with gutta-percha softened with chloroform, forced in after the method recommended by Dr. McKellops. And now was observed a phenomenon which indicated the loose histological structure of the tooth. *Threads of gutta-percha exuded from numerous points* on the surface of the root, some of them so tenuous that a powerful magnifying-glass was needed to observe them. The dentine was evidently full of chambers more or less minute, which communicated, some of them with each other and some with the surface, for this was subsequently found to be the case with that portion which had been removed. The tooth was reinstated and remains in good serviceable condition to-day. I may be

allowed to say that all the other teeth filled with gold have continued in an entirely satisfactory condition to the present time, requiring only the usual attention on the part of the dentist.

"This tooth was extracted for the purpose of removing a diseased part. What was the pathology of the cure? Of course, when one-third of the root was excised, there was created just so great a vacancy in the alveolar socket. This was filled,—with what? To my apprehension the peridental membrane of that part of the root being destroyed, the result has been a deposition of osseous matter,—there was enough of periosteum left for that,—and there has been a kind of ankylosis (of course not like that of synovial surfaces) which may account for the unusual firmness with which the tooth is now held in place. The success, in this instance, of replantation of a tooth of unusually loose histological structure, is in my opinion due to the removal of so large a portion of the root, and to the fact that in filling the pulp-chamber and canal a material was employed which penetrated to and quite closed all the open spaces in the dentine. May not many such teeth as was this be lost because of such unfilled spaces, into which fluids may infiltrate, and become the source of irritation?

"It would be interesting to know just what is the bond which holds a replanted tooth in position in all cases. Undoubtedly, periosteum resumes its function in most, but what of the instances in which tooth and socket are more or less denuded of the membrane and yet the case is successful? for such do occur. I hope this point may not be lost sight of in the discussion of the subject by the society.

Most truly yours,

"W. C. BARRETT, M.D., D.D.S."

Discussion.

Dr. W. H. Atkinson. If Dr. Thompson had been a good mechanic, he could have seen in an instant that it was mechanical interference that did the whole mischief in this case. A little care in the occlusion of the teeth would have saved all that mischief. The testimony is so clear that it is either yes or no. There is nothing difficult about it. Every tooth attached in that way must be encysted to be tolerated in the body. If Dr. Thompson had put gutta-percha on the sound teeth in such quantity as to prevent the occlusion of the sore tooth, he then would have relieved it and could have sent the man home free from the soreness that he says was mechanically induced. These cases, if seen sufficiently early, can be relieved by mechanical appliances. Would any man of common sense say that if disease could be diagnosed at the end of the root, the tooth should be extracted

rather than to cut away the diseased end? When we have broken up the periosteum we can never obtain better union than by scar-tissue. This is nothing but these little embryonal corpuscles so hardened that they become connective-tissue corpuscles. They are very low in vitality, and that is the reason they tolerate such meddling without greater mischief. The teeth like to be pressed. They are like the Irishman: they like somebody to hit them to make them feel well and comfortable. In the process of changing the occlusion by pushing or pulling you get an undue impingement of tissue against tissue, and force the parts into an abnormal condition. And that brings me to the statement that if they were tied too tightly that would obstruct the circulation. What inadequate conception must be in the mind of a man to say he would take the risk of drawing a tooth, the normal connections of which are healthy, for the sake of getting rid of a small portion at the end! If he knew anything of the nutrient anatomy and had the light, he would make a hole in the alveolus opposite the end of the root and amputate it, as has been done repeatedly. I have cut off the anterior root of the right inferior first molar which was covered with as hard nodules of lime as I ever saw, and in two days it was sweet as a new babe and healing nicely. What is mechanical *irritation*? How does it act? The point of pressure will be—on a straight-rooted tooth—pressing from below forwards, by the occlusion of the lower teeth in consequence of the loss of back ones, making the end of the tooth below push out, and that will press the point of the tooth against the inner portion of the tip of the socket. Mechanical pressure will so push away the pabulum as to interrupt nutrition. They talk about "*vascular* circulation"! There is no disturbance of the *vessels* at first. It is too fine, but the pabulum is pushed back and after a little while *irritations* come on, then solution of the lime-salts, and by a continuation of that process the tooth is loosened. It is the protoplasmic presentment that is forming in the corpuscles and making what he calls a membrane there, and then you get strings. You will see they are straight.

He says the pulp was living when he extracted the tooth. It ought not to have been taken out. Why? Because you run the risk of never having as good connection as there is already. The connection is nothing but protoplasmic strings that run from various bodies. When one of the members suffers, the other members suffer, because it is a bag of protoplasm made up from beginning to end of one continuous mass of living matter.

Dr. G. W. Weld. I have had a little experience in replanting and transplanting, especially in replanting, and I desire to say a very few words about it. My success in replanting has been with the centrals, the laterals, the canines and bicuspid. I think I have had about

seventy cases of replanting, and with one exception there has always been a successful attachment of the periosteum to the cementum, or the cementum to the periosteum, or the socket, as you chose. The exception I refer to was a case of a bicuspid of two roots; inflammation set in (which is unusual in my experience, it never having occurred before or since), and the root was extracted at the end of two days. One other case proved a failure after a successful attachment had taken place. This was a lateral in the mouth of a gentleman whose system became very much reduced from bleeding at the lungs and from malarial fever. In about a year after the operation the replanted root loosened, and he extracted it with a pair of pincers and brought it to my office. I have brought the tooth to show what its condition was. It is very clear that absorption took place almost entirely between the distal extremity of the bone and the cervical portion, exposing a platinum screw which attached a porcelain crown to the root. I also have here a crown which was worn on a replanted root for eighteen months. The gentleman came a few days ago and handed me the crown. I examined it and found that the screw had broken, leaving the root in the mouth and the screw in the root, and I don't know which was the firmer, the root in the arch or the screw in the root. I took a small engine-drill and drilled around the screw in the root and extracted it, and, although the gentleman is now wearing a pivot-tooth temporarily, he is waiting for a Richmond crown or some other good method of pivoting it. So much for that. In regard to the crown I want to say one word, because my experience in replanting can be attributed to this crown more or less, and I desire to say it has not been a hobby with me. After I ascertained and was fully convinced that replanting was a success and transplanting was a failure, the thought occurred to me that if a crown could be attached to the root of a tooth in some inexpensive way, many of them might be worn instead of artificial dentures, or of the more expensive kind of pivots. So I experimented with that in view, and with the results just mentioned. Now, in regard to transplanting, I recollect reading an article in some journal, some two or three years ago, in which the writer stated that replanting was a success, and also that transplanting was a success. He stated that an old tooth, for instance, which had lain around the laboratory for a long time could be inserted in the alveolus and a perfect union would take place. He also stated, that if the root was too large, it could be filed down to a proper size, and a new osseous deposit would take place.

I do not believe there is a pathological reason for supposing that new osseous deposit is ever formed under such conditions. In fact, I should as soon believe that a piece of ivory filed down to a proper size and inserted in the alveolus would grow as that such a tooth

should become attached. After replanting, I wish to observe that it is necessary, as you probably already know, that every particle of nerve-matter should be taken from the root. I have a case which exemplifies what I wish to say. It is a left superior lateral, which I extracted just before it commenced to suppurate. The gentleman had lost the right lateral, was wearing a plate, and preferred to lose this tooth rather than to suffer with the pain. I will pass it around. You will observe that about one-half of the nerve is in the root, and the gutta-percha, with which the root is filled, only extends down half-way.

Dr. Atkinson. In the paper read from Dr. Barrett it was said that there was pus-absorption,—erosion. Let us be a little careful about stumbling on words. Erosion is simply gnawing out. Pus can never gnaw anything out. The moment it becomes changed to *sanies* it may have in it a disintegrant, but the process by which the roots of the temporary teeth are removed to give place to the succeeding set,—under the microscope showing clearly this return to the embryonic condition,—is a legitimate process of breaking down the structure. If you will show any case of erosion that is not the result of retrograde metamorphosis of the tissues themselves, I will give you a Delmonico dinner. The point I wanted to make is, especially, the impossibility of pus as pus having the power to corrode anything, even the softest tissues, even nerve tissue. It has no affinity for it whatever. I grant you that the books on surgery will call the most offensive, outrageous, *sanies* pus, but that is not my fault. That is not the point. Because other people have misnamed things I don't wish my pet brother to misname them now in this nineteenth century with all the advances that have come. Let us take what belongs to us by studying how the teeth are nourished and sustained in the body. There is another point. You hear a great deal said by men of pseudo-learning that pressure of the gums upon irregular teeth is a source of disease of the alveolus. They forget that the teeth were put there by nature, and surrounded by a soft mass and they are formed *pari passu* with the sockets.

Adjourned.

AMERICAN DENTAL ASSOCIATION—TWENTIETH ANNUAL SESSION.

THIRD DAY.—*Morning Session (Continued).*

SECTION Fifth, Anatomy, Physiology, Histology, Microscopy, and Etiology, was taken up.

Dr. W. C. Barrett, Buffalo, N. Y., read a paper on "Anæsthesia."*

* This paper will be found on page 625 of this issue of the DENTAL COSMOS.

Dr. J. G. W. Werner. An important question with reference to Dr. Barrett's experiment to show that oxygenation of the blood is but a mechanical process is, Whether the lungs of the dog were molecularly dead, or whether they were still able to oxygenate the blood? The reason why the animal gasped for breath was because it needed oxygen. Pressure on the medulla may stop respiration, or for the time being relieve asphyxiation, for it controls the vaso-motor system. Nitrous oxide does not oxygenate the blood; it does the opposite. Narcotism does not begin until after the stage of asphyxiation has been passed. In most cases, for dental purposes, you only need asphyxiation. If you pass beyond that stage, the dangerous point in anæsthesia with nitrous oxide is reached, characterized by a dilatation, and perhaps permanent distention, of the blood-vessels. Dr. Werner did not think that in the new-born respiration would begin, could oxygen continue to be supplied otherwise to the blood.

Dr. Atkinson congratulated the association on being favored with a paper so full of thought and effort as Dr. Barrett's, but he objected to conclusions that do not conclude. He disagreed with some of the statements made in the paper. CO_2 does not make arterial blood venous. If nitrous oxide is circulating in blood-territory, there must be a dissolution of the bond holding the nitrogen before the oxygen can be free to be even carried by a blood-corpuscle. There was also some ambiguity of statement as to what constitutes circulation. Huxley states that carbonic di-oxide gas is a negative poison, an inactive activity. He considered Dr. Werner's statement as to the lack of oxygen in cases of asphyxiation as inadequate, in that it takes no account of the part played by respiration. Out of 100 per cent. of oxygen which the lungs receive, they appropriate only 4 per cent., leaving 96 per cent. to be exhaled. The breath which is exhaled is unfit for respiration until it has passed through the expurgation of the vegetable kingdom. All life rests upon this tripod,—innervation, circulation, and respiration. When you stop respiration you stop innervation and circulation, and you have death.

Dr. T. D. Shumway, Plymouth, Mass., stated that his experience with anæsthetics corroborated that detailed in the paper, in which there was much of interest to dentists and to their patients.

During the afternoon the members of the association, with their ladies, enjoyed a sail down the harbor, as the guests of the city of Boston, stopping at Deer Island, where is located the city reformatory for children. After inspecting the institution, and listening to musical exercises by the inmates, they partook of an elegant collation in the large dining-hall, to which they were welcomed by Mayor Prince in a humorous speech, to which Dr. Marvin responded happily on the

part of the guests. The party then boarded the boat once more, and, after steaming past Nantasket Beach, returned to the city. For the pleasure of this excursion the members of the association were indebted to the forethought of President Shepard, by whom the arrangements were made.

Evening Session.

Drs. J. H. Smith, W. H. Jones, and James McManus were appointed a committee to draft resolutions expressive of the sense of the association with reference to the death of Dr. H. L. Sage, of Bridgeport, Conn.

Dr. Taft offered a resolution that a committee of five be appointed to take into consideration the feasibility of holding an international dental congress. Adopted.

Dr. Wetherbee made an explanation of his method of finishing fillings, as he found he had been misunderstood when speaking on the subject. To some the idea had been conveyed that the body of the filling was expanded by burnishing. This was incorrect. In finishing a filling it should be filed down nearly to a level with the tooth-substance—say, within one-forty-eighth of an inch of the periphery of the cavity—and then heavily burnished so as to expand the periphery of the gold—not the body of the filling—against and down upon the enamel. This is for the purpose of securing perfect protection against moisture.

Section Fifth, Anatomy, Physiology, Histology, Microscopy, and Etiology, was declared still open, and the discussion of Dr. Barrett's paper on "Anæsthesia" was resumed.

Dr. Barrett acknowledged his indebtedness to Prof. Wm. H. Mason, of Norwich, Conn., to whose abilities as an experimental manipulator and teacher he paid a warm tribute. He also desired that there should be no misunderstanding among members of the association as to his own position. What he had said in his paper on "Anæsthesia" was said with diffidence, because of the variance of the conclusions therein enunciated with the views of those in whose presence he uncovered his head in deference to their superior knowledge; but the experiments which he had performed, which were conducted with the utmost care and with all the skill he could command, had led him to conclusions differing from the received teaching, and he must stand by his own judgment. He wished no one to hesitate to express an opinion through fear of hurting his feelings; he could not be hurt by honest criticism, but he objected to any such denunciation as had been bestowed upon one of the papers which had been read here.

CO₂ will darken the blood-corpuscles. He has repeatedly placed oxygenated blood in a jar, and adding the gas, has shaken it, and the

carbonic acid invariably changed the color of the blood. It is a quite common belief that nitrous oxide oxygenates the blood. His experiments have taught him that nitrous oxide has no such effect.

Dr. T. W. Brophy, Chicago, questioned the correctness of the statement that the majority of practitioners believe that nitrous oxide oxygenates the blood. He thinks the matter is better understood. His own view is that nitrous oxide prevents oxygenation of the blood, because the nitrous oxide is a chemical combination, while the air is merely a mechanical mixture of the same elements. When nitrous oxide is inhaled, the bonds of union between its elements are strong enough to prevent the blood from taking oxygen from it, and carbon di-oxide accumulates within the blood.

Dr. Wilson, Ohio, thinks there are many who do not know the difference between air and nitrous oxide; who believe they are the same thing; and who do not know the difference between a chemical combination and a mechanical mixture.

Dr. Barrett thinks there are very many dentists who believe that nitrous oxide is a respirable gas.

Dr. Buckingham. If we depended on oxygenation of the blood for producing anæsthesia, oxygen would be the best agent. But we do not know how an anæsthetic acts. Chloroform, ether, and nitrous oxide all produce the same effect, but their chemical composition is entirely different. Chloroform will not burn, ether is highly combustible, and nitrous oxide is a supporter of combustion. An anæsthetic is taken into the system and comes into contact with functional activities, and in some way produces paralysis, or stops their action in a manner we do not understand. It is probably carried through the circulation, but we can only see its effects. The only thing we can do is to carefully observe its effects on the organs and see if those effects are uniform, and then we may be able to tell how those effects are produced.

The discussion at this point assumed a desultory phase and was shortly closed.

Dr. C. A. Marvin, of Brooklyn, N. Y., read a paper on the "Unwritten Law of Dental Ethics."*

Section Third, Dental Literature and Nomenclature, was called, and Dr. Atkinson, the chairman, read a report on "Nomenclature and Terminology." This report was a continuation of the work of the two previous years, and showed the capabilities of the system advocated in the extreme generalization of terms.

Adjourned.

* This paper will be found on page 639 of this issue of the DENTAL COSMOS.

BIBLIOGRAPHICAL.

MECHANICAL DENTISTRY IN GOLD AND VULCANITE. Arranged with regard to the difficulties of the pupil, mechanical assistant, and young practitioner. By F. H. BALKWILL, L.D.S., M.O.S. London: J. & A. Churchill, 1880.

This work is not, as might be expected, a systematic manual of the subject of which it treats, but consists of somewhat desultory papers which have previously appeared in an English dental journal. In the preface the author states the object of the publication to be, "not to supplant any of the text-books on dental mechanics now in use, but merely to supplement them." The introduction, an addendum consisting of over forty pages, is devoted to a "comparative view of the mechanical conditions and functions of some of the lower animals, considerations of those of the natural teeth of man, suggestions for carrying out these conditions in artificial dentures," etc. Much of this is irrelevant, and that portion which is appropriate in a work on mechanical dentistry could have been expressed within a much narrower compass.

Chapter I., on regulating plates, refers to only one of the innumerable appliances for that purpose now in use. The plan given in this chapter of coating the plaster model with a solution of caoutchouc in chloroform, and then (instead of the usual waxing and packing) cutting the rubber accurately by pattern and adding it directly to the plaster model, where it firmly adheres through the agency of the solution previously painted upon it, and then merely enveloping in plaster in a flask and vulcanizing, is a valuable method, and is particularly so in the construction of regulating fixtures. In Chapter II., on "additions and repairs," the author justly claims importance for the plan of obtaining the impression over the plate in the mouth, so that the correct relation of the piece to remaining natural teeth may be preserved; the same idea is, however, fully and clearly expressed in Richardson's "Mechanical Dentistry," page 221.

In referring to materials for investing plates previous to soldering, it is stated that the plate "may now be placed in an investment of plaster or in clean casting-sand;" and while possible difficulties in this mode of procedure are hinted at, no mention is made of the fact that, mixed together in the proportions of plaster one part, sand five parts, the heating and soldering of an artificial denture are rendered easy and safe. In many directions the work shows want of familiarity with some of the best ordinary methods of the dental laboratory, and abounds in terms peculiar to the workshop, some of which would greatly puzzle the American reader.

We quote from page 49 the following reference to the different methods of retaining artificial dentures: "Artificial sets of teeth for edentulous mouths are usually arranged to maintain their proper position by springs. Harris, indeed, says spiral springs, formerly very much used, are now seldom employed, and Oakley Coles, in his 'Handbook,' says a large number of practitioners have dispensed with their application altogether. I think, however, that these expressions of opinion are rather sanguine, and that the excellence of work which is required by the practice has led these practitioners to undertake a difficulty uncalled for by a sufficient gain to the patient of comfort and convenience. It is generally easy to make a suction piece for an entire upper set, but to keep a complete lower denture steady at the same time multiplies the difficulties manifold; a slight shifting of the lower gives an uneven and unexpected bite, and the patient is liable to the mortification of finding both pieces hopelessly adrift in his or her mouth on most important occasions." The author also advances the opinion that, "However much we may admire the work of him who never uses springs for full sets, we shall find it safer practice to make their absence the exception rather than the rule." This judgment, which is reiterated in Chapter X., will read strangely to the dental profession of America, where spiral springs as a means of retaining sets of teeth have long since become things of the past, and are now so completely obsolete that a large majority of dentists have never even seen an artificial denture so arranged.

The chapter on pivoting teeth describes but a single method, in which there is nothing essentially new, although within a few years a great amount of inventive talent and skill have been given to the subject, resulting in many ingenious and varied methods of pivoting adapted to different classes of cases. Several of these methods have been described and illustrated in the dental journals, and more than one of them is justly entitled to notice in any chapter devoted to the teaching of pivoting.

Chapter XIII., "On the possibility of making porcelain gum blocks in the ordinary dental work-room of general practice," is so indefinitely worded that the reader will find some difficulty in arriving at its meaning; from what may be gleaned, however, it is evident that the author is quite unfamiliar with porcelain block-carving, which has been, and is still to some extent, an ordinary operation in the American dental laboratory, but is by him regarded in the light of a mere experiment, the attainment of which, though desirable, has not yet been consummated.

In many parts of the book the composition is bad, conspicuously so in the last chapter, while the headings of some of the chapters are anything but elegant: thus the title of Chapter IV. is "Suction Gold

Uppers." The ground covered is meager and for the most part without novelty; hence the work fails to fill the place of a supplement to the text-books now in use, and cannot be considered as a valuable contribution to the literature of prosthetic dentistry. C. J. E.

THE CARE AND CULTURE OF CHILDREN. A Practical Treatise for the Use of Parents. By THOMAS S. SOZINSKEY, M.D., Ph.D. Philadelphia: H. C. Watts & Co., 1880.

We have here a formidable octavo of four hundred and eighty-four pages, devoted to a discussion of all the problems involved in the care of children, by day and by night, in summer and winter, in health and disease, in accidents and emergencies; treating of the air they breathe, of the food they eat, of the clothing they wear, of their personal habits, of their creeping, walking, playing, and working; of the education and care of the senses of touch, taste, smell, hearing, sight, and speech. To a discussion of all these varied topics are added chapters on mental culture, the culture of the feelings, of the intellect, of the will, of the social sentiments, and of the religious sentiment; besides a special chapter on "the culture of beauty." There is much in the volume with reference to hygiene and an amount of information concerning diseases which it would be well for all parents to understand and remember, as also valuable suggestions with reference to education and the culture of the moral nature.

The author says truly that "the value of personal hygiene is not appreciated;" that "among the people there is not the wide-spread knowledge of the laws of health which there might and should be," and that "the ignorance of parents as to the way to rear their children so that they shall grow up healthy and strong, and have in them the promise of long life, is the cause of innumerable premature deaths, as well as of much vice of character." With equal truth he claims that "it is possible to shape the character through a process of training, and that the need for reform in the mental state of the people is quite as pressing as in the physical."

We have no doubt that, as is usual with all such books, the directions with regard to the care of the teeth and the treatment of them when diseased is the most faulty part of the volume, as witness the following paragraph:

"If the teeth are inclined to be loose, or the gums be spongy, the mouth should be rinsed occasionally with a solution of *alum*. The *tincture of myrrh* is beneficial. Tooth-powders of various kinds are much used. Those which are essentially scouring agents are harmful, for through them it is possible to destroy the enamel of the teeth. The occasional use, however, of say *powdered charcoal* or prepared chalk to remove accumulations of tartar is unobjectionable. But for this purpose a little *vinegar* is quite as good."

The italics are ours. Alum! charcoal!! vinegar!!!

Of toothache the author says: "If the pain is continuous, the cause being an irritated or inflamed condition of the parts around the root of a tooth, or of the tooth itself, the application of anything warm, such as hot water or the tincture of myrrh, will afford a temporary relief, as will a piece of ice, or anything else that is cold." . . . "Should the inflammation and pain be extremely marked and obstinate, advantage will be derived from the free use of chloral, or the solution of morphia, for a time." These directions are too indefinite and the agents too powerful to be safely intrusted to the discretion of mothers. It seems years behind the times, also, for the appearance of such a paragraph as the following:

"When a tooth becomes very largely decayed, and causes pain, it should be removed, whether it be temporary or permanent."

The author may know all about the rest of the subjects which he discusses, but he is decidedly "off-color" in dental matters.

TRAITÉ D' ANESTHÉSIE CHIRURGICALE, contenant la description et les application de la Méthode Anesthésique de M. Paul Bert. Par le Docteur J. B. ROTTENSTEIN, Membre de l' Académie Leopoldina Carolina, de la Société Odontologique de New York, etc. Avec 41 figures intercalées dans le texte. Paris: Librairie Germer Ballière et Cie, 1880.

This is a "portly" treatise in French on the subject of general surgical anæsthesia. Its chief *raison d'être*, however, appears to be to expound the recent method of administering nitrous oxide gas devised by M. Paul Bert, to whom the volume is dedicated. Our space will not permit of an elaborate criticism or analysis of the book, but we may say that the system of M. Paul Bert had its inception in the effort to demonstrate that nitrous oxide gas was not essentially an asphyxiating agent, but a true anæsthetic, and to devise a mode of producing anæsthesia with it which would be sufficiently prolonged to admit of the performance of most surgical operations. The system is made clear in the text and illustrated with cuts, and directs, in brief, a large air-tight chamber of sufficient dimensions to admit the patient, the surgeon, and his assistants. With the aid of a pump the required barometric pressure can be produced to raise it to two atmospheres, when about equal parts of air and nitrous oxide are administered, thus producing anæsthesia without asphyxia. Various experiments and operations performed according to this system demonstrated its practicability (in one case the operation being prolonged twenty-six minutes), but that this method of producing anæsthesia can ever be popularized is problematical.

The volume is prefixed with a portrait of Horace Wells, to whom

the author gives the credit of having been the discoverer of anæsthesia by the use of nitrous oxide. He says that it had been the general belief in France that Jackson was entitled to this honor, but that, after a careful examination of much documentary evidence, he finds it conclusive that the credit belongs to Horace Wells.

THE COMPEND OF ANATOMY. For Use in the Dissecting-Room and in Preparing for Examinations. By JOHN B. ROBERTS, A.M., M.D., Demonstrator of Anatomy in the Philadelphia Dental College. Philadelphia: C. C. Roberts & Co., 1881.

Of the class to which it belongs this book is a fair sample. Such compends have their uses, but a very limited range of practical value. They are too condensed. The information they afford is too meager even to be satisfactory to a student in the dissecting-room. Of necessity almost all reference to surgical relations—perhaps the most important branch of practical anatomy—must be excluded, as must also all illustrations. Nevertheless, the book before us we believe to be in the main accurate; the condensation has been well performed, and will at least not confuse or mislead the student who may employ it, although we would object to such loose translations for the benefit of students—who from the first should be taught strict accuracy in the use of scientific terms—as those which transform *socia parotidis* into the “associated parotid,” and the *vasti* muscles into the “external and internal vast,” and others of like character. Typographically, the book contains but few errors. On page 171 the curve of the urethra is described, “when the *pelvis* is erect,” and one or two other similar errata are noticeable; but as a whole the book reflects credit on the diligence and accuracy of the author. Students who cannot afford to purchase Gray, or who feel the need of a compend for its convenience and condensation, will not make a mistake in buying Dr. Roberts's little volume.

HYGIENIC AND SANATIVE MEASURES FOR CHRONIC CATARRHAL INFLAMMATION OF THE NOSE, THROAT, AND EARS. Part I. By THOMAS F. RUMBOLD, M.D. St. Louis: Geo. O. Rumbold & Co., 1880.

This work is claimed by the author to be the result of a constant study of the hygiene of catarrh for a period of twenty years. He argues that the successful management of this common and persistent affection depends on the continued observance of hygienic rules, and that attention to the laws of health is essential, even after cure, to prevent a recurrence of the complaint; that the patient's daily dress and habits exercise a controlling influence in its production or prevention. The work is intended as a guide to physicians and to patients afflicted with catarrh. It treats of the head and its protec-

tion, night-caps, shampooing, wrappings for the neck, furs, shirt-collars, clothing, under-clothing, the feet and their covering; of colds, temperature, ventilation, diet, stimulants, exercise, etc.

The author gives directions, which are intelligent and comprehensive, as to the cleaning of the nasal passages, of the ears, as to bathing and inunction, and gives special attention to the discussion of the effects of tobacco in producing and maintaining catarrhal conditions. He devotes a chapter to the illustration of the effects of diseased teeth and gums in causing morbid changes of the mucous membrane of the nasal and pharyngo-nasal cavities, the throat and ears, noting also the fact that a catarrhal inflammation, especially of the antrum of Highmore, may cause a diseased condition of the mouth.

Part II. is to consist of therapeutics and operative procedures.

Attention to the author's teachings could hardly fail to prove of value to persons afflicted with catarrh.

HOW A PERSON THREATENED OR AFFLICTED WITH BRIGHT'S DISEASE OUGHT TO LIVE. By JOSEPH F. EDWARDS, M.D. Philadelphia: Presley Blakiston, 1880.

This little volume treats in non-professional and easily-understood language of the functions of the kidneys and their derangement; of Bright's disease,—what it is, and how it may be held in check. The author asserts his belief that, by living in accordance with the "Rules" which he lays down, a person afflicted with Bright's disease may live in comfort and comparatively good health for many years, outliving thousands of those around him who have no such disease. We accept the opinion of the author that very few diseases are so liable to be aggravated by neglect of hygienic rules as Bright's disease of the kidneys, and have no doubt that a careful perusal of this little book, and attention to its precepts, would enable sufferers of the class to which it is addressed to protract their lives far beyond the length which could possibly be hoped for under ordinary circumstances.

THE PHYSICIAN'S VISITING-LIST FOR 1881. Philadelphia: Lindsay & Blakiston.

The issue for 1881 of this convenient visiting-list is its thirtieth annual appearance,—a fact which shows that it meets the needs of physicians. In addition to the blank leaves for visiting-list, addresses of patients and nurses, memoranda of wants, of accounts, of obstetric and vaccination engagements, record of births, deaths, general memoranda, etc., it contains a list of poisons and antidotes, Hall's ready method in asphyxia, the metric system of weights and measures, obstetric tables, and a very full posological table, in which the doses are expressed in both apothecaries' and metric weights and measures.

PUBLISHERS' NOTICE.

CLOSE OF THE VOLUME.

THE progress of any art or science is indicated by the quality of its literature, and is, indeed, largely dependent upon the character of its periodical publications. For not only does a well-conducted journal promote and register professional improvement,—advancement in usefulness and self-respect,—but secures as well for the specialty to which it is devoted advancement in public regard and in the estimation of the workers in associate sciences. If any source of improvement can be rightly esteemed more valuable than another, a good journal is the one entitled to such preference.

That dentistry as a science and an art has advanced with wonderful rapidity during the past two decades is not questioned, and we think that twenty-two years of uninterrupted monthly publication, with a steady increase in circulation and influence, justifies the DENTAL COSMOS in the conviction that it is entitled to an honorable share of credit for the progress made.

The publication of the DENTAL COSMOS was commenced twenty-two years ago, with the intention indicated by its title—to cover the dentists' *world* of science and practice. Its publishers think that title and intention—name and aim—have been well maintained. We believe that our efforts have been appreciated, and that the monthly issues of the DENTAL COSMOS are esteemed by a large circle of readers as having not only a current but a permanent value.

With this number we complete our engagement to subscribers for the Twenty-second Volume. On January 1, the initial number of the Twenty-third Volume will appear. We can promise only that the same efforts will be made in the future as in the past to make the DENTAL COSMOS the leading dental journal of the world.

Dr. J. W. White will continue in the editorship.

For information as to terms, etc., for the forthcoming volume, we ask attention to the colored slip preceding the advertising-pages of this number.

TRUSTEES OF SAMUEL S. WHITE.

PERISCOPE.

HEMORRHAGE FROM THE MOUTH—DEATH.—William A—, aged eighteen, fairly well-nourished, but presenting a strumous and anæmic appearance, and who for some time past had lived badly, was admitted on July 9, 1880. He first attended as an out-patient on July 8, and stated that on July 4, about 3 A.M., he found that he was bleeding from the gums. This lasted for about four hours and then stopped, but reappeared shortly before coming to the hospital. He had never, he said, noticed it before, but had been subject to profuse hæmoptysis, and at times had found "large blue lumps" on the chest, over the sternum, coming without any cause. These swellings lasted a few days, and then disappeared. He had never had any hæmatemesis or melæna, nor, to the best of his belief, any effusion into the joints. He volunteered the statement that four of his relations had died of the same thing, but did not know what relationship they bore to him. This made him extremely anxious. He was ordered a gallic and sulphuric acid mixture, and a mouth-wash of alum. This seemed to have had a slightly beneficial effect for a time, but the bleeding returned as bad as ever the following morning (July 9).

On admission a physical examination revealed a soft systolic murmur at the apex of the heart. Blood was oozing freely from the gums of the upper jaw on the right side. A mixture of iron and the liquid extract of ergot was ordered, and a mouth-wash was given containing equal parts of the tincture of perchloride of iron and water, and the patient was encouraged to suck ice freely. The bowels had acted well. He was put on a liberal diet, which he seemed to take with relish. The hemorrhage, however, abated little, if anything. The same evening counter-irritation was tried to the back of the neck, but without any perceptible advantage.

On July 11 he presented a ghastly appearance. He had had a very bad night, and after dozing a little had vomited black discolored blood at intervals. The hemorrhage had not ceased for a moment. On examining the mouth, the blood seemed to be now coming with a pulse-like motion from the gums of the last two upper molars on the right side; it was watery-looking, and gave the impression of its being arterial. The man had no pain in any of his teeth, which were all sound and of exceptional whiteness. Considering the urgency of the case, it was thought that the actual cautery might be applied with advantage. Accordingly, Mr. Wright, the house-surgeon, passed the cautery along the bleeding surfaces on both sides of the teeth. This produced an eschar over the place; but the gums of the adjoining teeth now began to bleed. Lint soaked in a solution of the sub-sulphate of iron was now freely used, and the hemorrhage was completely stopped for about one hour. At 3 P.M. it returned again from the mucous membrane of the cheek and the whole line of gums. The patient was now thoroughly exhausted, presenting a blanched and haggard look, and complaining of pain in the chest and epigastrium. A linseed-meal poultice was applied with relief, and the sub-sulphate of iron used as before, this time, however, with not such a happy result. Constantly vomiting altered blood and rapidly be-

coming weaker, he was at last unable to retain the nourishment necessary to sustain life, and died exhausted at 2 A.M. on July 12.—*West London Hospital Reports in Lancet.*

SUPPOSED MALIGNANT TUMOR OF THE ANTRUM FROM A CARIOUS TOOTH.—Many years since a case of a somewhat equivocal character came under the care of a friend of mine, presenting symptoms of a very grave nature. The subject of it was a gentleman, forty-seven years of age, whose health had been failing for a considerable time, and whose personal appearance would lead to a suspicion of the existence of malignant disease.

I will narrate the particulars in the words of my friend, who related it to me as a great triumph on the part of a dentist, and as a specimen of the error in diagnosis that might sometimes be committed even by the most eminent surgeon:

"On the 11th of November, 1866, a gentleman consulted me for an enormous projection of the palate, impeding deglutition and preventing proper articulation. A corresponding swelling made its appearance in the right maxillary bone, pressing the floor of the orbit upwards to such an extent as to cause some protrusion of the eye, and also extending laterally, so as almost to close the right nostril. The palate bone was considerably thinned, and on pressure was found to be very elastic. The patient complained of excruciating pain, which came on periodically, and was much increased by pressure in any direction, but in the greatest degree by mastication. He looked sallow and very anxious, and reduced to the extreme of weakness.

"I could not but arrive at the conclusion that this was a case of malignant tumor of the antrum, and advised my patient to lose no time in going to London, and consulting the most distinguished surgeon then living. Having made the necessary arrangements, he went to London, and consulted the professor before alluded to; and on December 20th I received his opinion in these words:

"'There is, I have no doubt, a tumor in the right antrum. Before giving a decided opinion as to an operation, I think it will be better to watch progress; but if the growth be of the short duration which Mr. J—— states, I fear there will be serious mischief ere long, and on that account an urgent necessity for the operation.'

"It happened that the patient had a great many stumps of teeth, which irritated the gums and produced pain, but only one tooth on the right side,—the canine. I went with him to a dentist to have the stumps removed, and at the same time it was determined to extract the canine tooth. A drop of offensive matter followed the extraction, and on passing a trocar into the antrum a deluge of matter followed it of so dreadfully offensive character that the dentist was driven from his room for the remainder of the day. On exploring the antrum not a trace of tumor existed. The patient rapidly got well, and now enjoys excellent health."—*President's Address, Western Counties Dental Association, in Monthly Review of Dental Surgery.*

CARIOUS TEETH AS A CAUSE OF ILLNESS.—Mr. E. Canton related some cases in which carious teeth had been the unsuspected cause of serious illness. It was, for instance, well known that imperfect mastication, due to carious teeth, was not an uncommon cause of diarrhoea, but it did not appear to be generally recognized that constipa-

tion might be due to this cause; yet of this he could relate many instances. A gentleman was brought to him for supposed cancer of the rectum, and a lady on account of supposed tumor of the spleen. The symptoms in these cases were due to large accumulations of fæces in the rectum and in the descending colon respectively, and in both bad teeth and imperfect mastication of food were the real causes of mischief. A course of purgative medicine and a set of teeth completely cured both patients. Another gentleman, aged forty-five, suffered from spasm of the muscles of the front of the thigh, supposed to be due to spinal disease. The real cause turned out to be an impaction of fæces in the cæcum, which pressed upon and irritated the anterior crural nerve. This patient was almost edentulous, and a set of teeth relieved him from the habitual constipation from which he had previously suffered. Imperfect mastication and consequent constipation was a common cause of sciatica on the left side. In such cases Mr. Canton always commenced treatment with a strong cathartic, and very frequently a large collection of solid fæces would be removed, even though no accumulation had previously been suspected. Bad teeth and imperfect mastication often caused a general state of weakness, which rendered the patient an easy prey to any disease by which he might be attacked. Mr. Canton related the case of a gentleman who was said to be dying of "atrophy," and who had been for a long time under medical treatment. Mr. Canton could find no evidence of organic disease, but as the patient's teeth were in a very bad state he advised him to have a set made. He did so, and made a good recovery without any more medicine. In women this low state of nutrition was frequently accompanied by barrenness. A young lady, who had been married some time, but had no family, was brought to Mr. Canton by her husband. She was thin and weak, suffering from indigestion, and had very bad teeth. Mr. Canton ordered artificial teeth; the patient grew stout and strong, soon became pregnant, and eventually had several children. Mr. Canton concluded by relating some cases confirmatory of the conclusions arrived at by Dr. Brunton in his paper lately read before the society. In one case a strong, healthy-looking boy, aged nineteen, was cured of epilepsy by exposing the crown of a retarded wisdom-tooth, and in another case paralysis of the left leg in a young lady appeared to be due to a similar cause.—*Report Odont. Soc. of Great Britain, in Med. Times and Gaz.*

LANCING THE GUMS.—The backward pressure of the growing tooth or teeth becomes a potent cause of aggravation to any disorder which may affect the child at the time, and, in many instances, it is the sole and direct cause of the special trouble which the infant exhibits. If this be admitted, the conclusion is evident that this backward pressure must be relieved by lancing the gum over the advancing tooth or teeth. Very frequently, however, I am called to see sick children who are teething, but where there is no tooth that is causing much or any irritation. Perhaps the incisors are through but the first molars have not begun to make much pressure upon the gums, or the incisors and first molars are through but the canines are not making much painful pressure. In such cases, when I make up my mind that the tooth or teeth coming out are not causing irritation, I do not use the lancet, even though the mother urges its application.

Bear in mind that the gum-lancet is to be used only to relieve a condition of irritation and of suffering that if prolonged may give rise to grave consequences. Recollect, also, that it is not a matter of indifference whether you cut into a developing tooth-follicle or not. I believe that when we lance into the follicle of a growing tooth too soon we interfere, as a consequence of the division of many blood-vessels, with the full nutrition, and hence that its subsequent development is slower. I believe that this explanation is the correct one, and accounts for the slow eruption of teeth that have been lanced too early and unnecessarily, and not that their subsequent slower development is due to a hard, resisting cicatrix, to which it is usually attributed, since it is well known that cicatricial tissue, being of a lower organization, has less vitality and is more readily absorbed than the normal structure of the part.—*Dr. Penrose, in Medical Gazette.*

SPINDLE-CELL SARCOMA OF THE LOWER JAW.—The specimen involved the greater portion of the body of the lower jaw, which was removed by operation from a boy eleven years of age. Ten months before the operation of removal was performed the boy was struck upon the jaw over the region of the left canine tooth, which was carious; soon after swelling appeared at this point, and continued until the growth reached the size to be observed in the specimen. Including the bone, which it embraces, the tumor is the size of a large lemon, projecting more from the external surface than from the internal, and extending laterally from the second bicuspid tooth of the left side to the first bicuspid tooth of the right side. On the left side the teeth were quite loose, being pushed from the alveoli and held by the soft structure of the tumor. On the right they were firmer, and not dislodged to the same extent as those on the left. Examination shows the tumor to have taken origin in the periosteum, and to have involved this membrane in its growth to the extent described. Microscopic examination reveals its structure to be that of a sarcoma of the spindle-cell variety. The growth was removed with the portion of the jaw involved, by making an incision along the inferior border of the bone from just in front of the anterior inferior angle of the masseter muscle on one side to the corresponding point on the other, beginning and ending at these points, so as to avoid wounding the facial arteries. A short transverse incision from the symphysis of the jaw to within *one inch* of the border of the lower lip was also made, and the flaps dissected upward, in this way fully exposing the tumor. The muscular attachments, with the mucous membrane, were divided, and the bone sawed through on either side. The patient made a good recovery.—*Dr. J. Ewing Mears before Path. Soc. of Phila., in Med. Times.*

NECROSIS OF SUPERIOR MAXILLARY BONE FOLLOWING TYPHOID FEVER.—The specimen of necrosis of superior maxillary bone was removed by operation from a boy six years of age, who had suffered from an attack of typhoid fever. The history given by the mother of the patient was as follows: "Fifteen weeks since, the boy was attacked with typhoid fever, and was quite ill for three weeks. During the fourth week of the disease the right side of the face gradually swelled, and, under the belief that an abscess was forming, a poultice

was applied. Suppuration ensued, and a copious discharge of very offensive pus escaped. The teeth, as far forward as the canine, became loose, and were removed." The soft tissues gradually receded from the necrosed portion of bone, exposing the alveolar border. Although the dead bone felt quite firm in place, it was thought best to remove it, believing that it was detached and was held by the soft structures. These were accordingly separated by the knife, and the piece was grasped by the bone-forceps and dislodged. It measured one inch and a quarter from before backwards, and one inch from below upwards, and consisted of the greater portion of the body and alveolar process of the bone, with parts of the malar, nasal, and palatine processes.

The occurrence of necrosis of the jaws after attacks of exanthematous diseases, as smallpox, scarlet fever, and measles, is well established by the numerous instances which have been recorded, but is regarded by Mr. Salter (Holmes's Surgery) as rare after the continued fevers. Dr. Keen (Toner Lectures, 1877) also alludes to its rare occurrence *after typhoid fever*.—*Dr. J. Ewing Mears before Path. Soc. of Phila., in Med. Times.*

FISTULOUS OPENING IN THE SHOULDER FROM A CARIOUS TOOTH.—No doubt it has occurred to many of you how frequently a carious tooth will give rise to a fistulous opening, not only in the face, but at a considerable distance from the seat of irritation.

Many such have come under my own observation; but the same surgeon that furnished the particulars of the foregoing case,* mentioned an instance of a lady in Devonshire who consulted him for a fistulous opening in the shoulder of three years' standing. She had consulted several surgeons of eminence, among others Sir Astley Cooper and Sir Benjamin Brodie, both of whom found the case intractable. Her general health was good, nor did she suffer any pain, excepting from the ineffectual application of caustics, and even actual cautery. On visiting this lady one day she complained of a slight pain in a molar tooth, on the same side as the fistula. On examination all her teeth appeared to be sound, but on passing a probe between two molar teeth the pain was considerably increased. The surgeon desired her to consult Mr. Sheffield, late of Exeter, who extracted a decayed molar tooth, and in ten days this fistula of three years' standing was healed.

These are two of many instances in which the dentist has succeeded in relieving distressing conditions where the best directed efforts of eminent surgeons have failed. I will not weary you with numerous other illustrations, and only cite these, not out of any arrogance or assumed superiority, but simply to exemplify what I consider to be a great advantage derivable from the amalgamation of the surgical and dental professions.—*President's Address, Western Counties Dental Association, in Monthly Review of Dental Surgery.*

CASE OF FRACTURE OF THE TEETH PRODUCING SEVERE SYMPTOMS.—E. M., a boy, aged thirteen, admitted into Stephen ward on May 17, 1880. Three days before admission had a quarrel with another boy, who struck him in the mouth with a scoop, breaking off the

* See page 672, "Supposed Malignant Tumor of the Antrum."

upper half of his two central incisors and the anterior surfaces and upper halves of his two lateral incisors, the pulps being quite exposed. Was quite well up to this date. He cried a little after the accident, but went on with his work. He did not swallow the fragments of teeth. On the same evening he had diarrhœa, his bowels being open four times. The next day he had pain in the head, and diarrhœa, the bowels acting six times. On the day after, he had swimming in the head, shivering, pain in the abdomen and teeth; the bowels acted nine times. On the day of admission his bowels had been opened five times by 10 A.M., and he had vomited twice. When first seen he had a hot, dry skin, and temperature 100.2° , pulse 120, together with pain in the abdomen. The tongue was furred, and the lips tender, but without sore. He was thirsty, and all the organs of the body but the teeth were normal. The four lower incisors were broken off about a third of their height from the gum. The red pulp was exposed; it did not bleed, but was excessively tender. Put on milk diet. A day or two after admission, the temperature fell to normal, the diarrhœa stopped, and all the symptoms of fever passed off. Four days after admission, the pulps were extirpated, under chloroform, by Mr. Moon, and the cavities plugged with cotton-wool soaked in carbolic acid. This was reapplied six days afterward, and four days after that the cavities were stopped with gutta-percha, and the boy went out well.—*W. H. White, M.B., in the Medical Times and Gazette.*

RETENTION OF SALIVA.—M. Terrier relates the case of a man, thirty-five years of age, who complained after breakfast of an increase in the size of one of his cheeks. On examination of the parotid region, there was found a hard and slightly elastic tumefaction. When the orifice of Steno's duct was examined it was found to be closed by a small aphtha. A lachrymal probe was passed some distance into the duct without any difficulty, and on its withdrawal a large quantity of saliva issued. There was no calculus in the duct.—*Gazette Hebdomadaire.*

HINTS AND QUERIES.

"He that questioneth much shall learn much."—BACON.

CORRESPONDENTS desiring a reply in this department are requested to make use of *distinctive signatures or initials*, and avoid the practice of signing their communications Reader, Subscriber, etc.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names. We cannot insert queries or replies except they are so accompanied. Names not necessarily for publication.

WHAT is the best method to employ in removing porcelain teeth from a vulcanite base without breaking the teeth or damaging the pins?—C.

WILL some one kindly instruct me as to the most efficient method of repairing celluloid plates with the "Best" celluloid apparatus?—J. W. B.

WILL some one who knows whereof he speaks give his methods and experience in bleaching discolored teeth?—NEVERTON.

CAN any of the readers of the DENTAL COSMOS give me a remedy for excessive sweating of the hands? The inconvenience of such an affliction to a dentist can be readily understood.—W. R. P.

WILL some one give a formula of an amalgam that has been tested and found to possess the requisite qualities for the desired end, viz., salvation of decayed teeth?—W. F. S.

As filling pulp-canals with gold, cement, or gutta-percha does not strengthen this portion of the tooth, or as increased strength here is not needed, and as cotton saturated with carbolic acid or creasote provides all that is necessary, will some of those who fill pulp-canals with gold, etc., be kind enough to inform me for what purpose it is done?—Z. I. N.

LAST week a lady came to me with the left central broken off just above the pulp. As the tooth was perfectly sound, I disliked to make retaining-points, as it would involve the sacrifice of too much tooth-substance, so I inserted two of Osmond's screws and built around them. I have been told since by an old dentist that the screws will work loose, and finally lose their hold. Would it have been better to have cut retaining-points?—C. S. V. O.

TO-DAY I was asked to look at the mouth of a lady who had worn a rubber plate for fifteen years. The plate is small, having only the four superior incisors on it. She complains that the sides of her tongue have been sore for the past six or seven years. It looks as if it was cracked, especially towards the tip; also it shows little red spots, which she calls "little hard lumps," which at times are more sore than at others. She has no trouble with the stomach; says the plate does not trouble her in the least. The lower teeth have no deposit of salivary calculus, though not very clean, and there are none but amalgam fillings in the natural teeth. The roof of the mouth is in good condition. The plate is much thicker than necessary, and does not fit very well. What is the matter? what causes it? and what will cure?—E. H. A.

I HAVE made many inquiries as to the manipulation of soft rubber,—how to attain the proper degree of hardness without destroying its elasticity,—but have been unable to get any satisfactory reply. Will some one be good enough to give me the *modus operandi*? I have a Whitney vulcanizer and a "Best" celluloid apparatus.—J. W. B.

[The production of soft rubber is not a question of manipulation, but of the use of a specially prepared rubber in which a smaller proportion of sulphur has been combined with the caoutchouc than is incorporated with that prepared for base plates. The former is employed in the construction of artificial palates, and is called velum or palate-rubber. It can be had at the depots.—ED. DENTAL COSMOS.]

I HAVE noticed various extracts in the DENTAL COSMOS credited to the Proceedings of the Association of Surgeons practicing Dental Surgery. Can any one inform me how many qualified surgeons are supposed to be practicing dentistry in England?

[Answer.—Mr. John Tomes, in a recent communication to the *British Medical Journal*, estimates the number to be about one hundred.—ED. DENTAL COSMOS.]

G. A. F. asks (in "Hints and Queries," July number of the DENTAL COSMOS) with reference to the most suitable time to replace artificial teeth after extraction. In the August number I see a reply, but the writer fails to give what to me is practically important. For a *permanent* set of artificial teeth I believe all agree to wait for the complete absorption of the alveolus, but it is not well to let a patient be without a plate for such a length of time. I wait until all the

pits in the gums caused by extraction are almost or quite obliterated, leaving the gums smooth and firm. This takes place, in middle-aged persons of average constitution, about the end of the fifth month, never later than the sixth. After this the anterior border of the inferior alveolar ridge begins to curl backwards (posteriorly or lingually), forming quite a rim of pretty firm tissue, which is very much in the way of getting a correct impression, or, consequently, a good fit. This will take place in ten or twelve months after extraction. After this the ridge continues to recede and flatten until in about three years it is perfectly flat: there is no ridge left,—nothing there “to tie to,”—so I would say from the fifth to the sixth month is the best time.—B. F. H.

SOME four months ago Miss H. applied to me to have the right inferior wisdom-tooth extracted, it being quite painful. I complied with her request, as the tooth had been filled twice by other dentists and once by myself, and was still troublesome. The decay was on the posterior surface, and very difficult of access. I suggested replanting it after filling, which she quickly agreed to. I proceeded to fill, and replaced it in the socket with but very slight pain. I treated it with iodine and aconite for a few days, when it became entirely well. The tooth had two nicely-shaped roots. I think success in this case is complete, and the lady is very much pleased with it.—N. J. ALVORD, *Chicago*.

TO THE EDITOR OF THE DENTAL COSMOS:—In a bibliographical notice in your October number is found the following quotation from Dr. Kingsley's “Oral Deformities:” “Of all obturators to supply deficiencies of the soft palate and induce correct articulation, the one introduced by Suersen contains the truest principles and is best adapted to the purpose.” The quotation is premised by a statement of Dr. Kingsley's that “an elastic velum is better in most cases of congenital defect.”

I have thought that some one might be led, from this quotation, into adopting the Suersen method without consulting the entire work of Dr. Kingsley, and thus have to go through what I did, when for weary months I faithfully worked by the Suersen method, only to be confronted by failure. I think Dr. Kingsley teaches that, except in rare cases, this obturator can be worn successfully only after an elastic velum has *first* been worn for some time to “educate the constrictor muscles of the pharynx so that they will abide the Suersen obturator.” I had so much trouble with this method, which was made entirely easy when I followed Kingsley's method, that I must be pardoned for thinking that he gives Suersen too much credit. Young practitioners should beware of trying a Suersen obturator in congenital fissure when the pharyngeal muscles are in working order.—J. D. PATTERSON, *Lawrence, Kansas*.

TO THE EDITOR OF THE DENTAL COSMOS:—Is it worth while to occupy your space in referring to the letter of J. Masters, which appeared in your October number? The request he makes seems to me not only undesirable, but absurd. If I mistake not, “J. Masters” is himself an L.D.S. of Ireland “*sine curriculum*.” The same advantage is given to practitioners at Edinburgh and Glasgow. Why cannot those desiring a qualification take the one legalized in this country? It would certainly better tend to raise the profession than the obtaining of foreign diplomas. Do they fear the examinations for the home qualification, but think they could slip through those for the American? So it appears. “Curriculum men would not feel that an advantage had been taken of them.” No; not those with L.D.S. They would look down still more upon the American degrees. But those of us holding those degrees might think so. A D.D.S. or

D.M.D. degree would be of no more advantage now than it would have been before the passing of the act, while the former has received sufficient slights already without doing anything to depreciate it.—D.D.S., L.D.S. EDIN., SINE CURR.

CAMDEN, S. C., Sept. 26, 1880.

EDITOR OF THE DENTAL COSMOS:

DEAR SIR,—Will you allow me space in the COSMOS to correct statements made at the meeting of the dentists in New York, in August, in regard to Dr. C. Starr Brewster, by Dr. J. G. Ambler and by a writer in the *New York Sun*, who thought to correct Dr. Ambler, who stated that Dr. Brewster “struggled for years in Paris, and had all he could do to keep soul and body together, but finally succeeded in obtaining practice, from having inserted false teeth for Louis Philippe”? Dr. Brewster settled in Paris in 1834, and was very soon in a fair practice, which was no doubt increased by the services he rendered his Majesty. There was no occasion for him to “struggle” for a living, as he carried with him from Charleston, S. C., means sufficient to live on for years, and could command from thirty to forty thousand dollars.

Dr. Brewster's visit to St. Petersburg was his *second* visit to Russia; the first was at the invitation of a Russian nobleman for whom Dr. Brewster rendered a service in Paris. At the nobleman's residence he met Duke Michael, and at *his* instance the emperor invited Dr. Brewster to St. Petersburg; but Dr. Brewster, having other engagements, did not go to St. Petersburg then, but the next year he had a direct invitation from the emperor, which he accepted, remaining in St. Petersburg a month or six weeks, receiving for his services ten thousand dollars and being created a knight of the order of St. Stanislaus.

It may not be a matter of essential importance to the profession at what time an old personal and professional friend met with his success as one of the earliest American dentists who settled in Europe, but facts may be as useful as errors. Having been acquainted with Dr. C. Starr Brewster from the earliest years of his professional career (commencing in 1819); a student in his office, No. 5 Park Place, New York; in practice with him in Charleston, S. C.; corresponding with him after he settled in Paris, at No. 11 Rue de la Paix, into the decade of 1840,—I “speak as to what I know,” and testify to what I have had in writing from Dr. Brewster.

Respectfully yours,

M. BISSELL.

HOLLAND'S DENTAL LAW [Translated by GEORGE H. PERINE, D.D.S., New York].—Below is a translation of the Dutch law pertaining to the practice of dental surgery in Holland. In the Netherlands dentistry for years was restricted by a separate law. In the year 1865 it was decided to make the law uniform, and those wishing to practice dental surgery were compelled to study medicine; the degree of Doctor of Medicine entitled them to practice dental surgery without further study or examination. But few persons, however, directed exclusive attention to dentistry in Holland up to 1878, when in December of that year a law was passed regulating the conditions for obtaining the degree to practice medicine, midwifery, dentistry, etc. The new law pertaining to dentistry provides as follows:

Article I. For the degree of dentist (Trandmuster—licentiate to practice dentistry), by which is understood local treatment of the diseases to which the teeth, alveolar processes, and gums are liable.

Article II. This degree is obtained after having passed the practical examination successfully,—that is, satisfactory proofs are required of the knowledge of operative dentistry and the placing of artificial dentures.

Article III. To the practical examination those only are admitted who have passed their theoretical examination on dentistry successfully.

Article IV. The theoretical examination comprises the anatomy of the teeth, alveolar process, and gums; their physiology, their hygiene, pathology, and therapeutics, in which is included the knowledge of diagnosing the diseases of the teeth, alveolar process, and gums, whether arising locally or remote (constitutional), pharmacodynamie, and the art of prescribing as is necessary,—prescribing local medicines for the diseases of the above-named parts.

Article V. The medical universities of the Netherlands are qualified (have the right) to examine on theoretic dentistry, and to give a certificate to those who have successfully passed the same.

Article VI. The amount of five-and-twenty (25) guilders must be paid to the president of the faculty by the applicant before submitting to the examination. In case of being unsuccessful, no second payment is required at the second application.

Article VII. A diploma will be given when the examinations have been passed satisfactorily, and the amount of twenty-five guilders has been paid to the president of the committee, which entitles the possessor to style himself physician, dentist, etc.

Article VIII. All those having passed their examination successfully must, before being admitted, take in the presence of the president of the examining board the following oath (or promise): I swear (or promise) that I will practice dentistry according to the legally fixed stipulations, and to the best of my knowledge and ability; that I never in my practice will disclose to any one what in secret is trusted to me, or come to my knowledge, except when my testimony is required as witness or expert by the court, or I am legally obliged to give information.

So help me God Almighty (that I promise).

Resolutions passed February 12, 1879:

Article I. Two periods will be appointed in the civil year for making the examinations,—the first lasting six weeks in the first eight months, and the last for four weeks during the remaining four months. Day and hour will be appointed by the president of the faculty, or by the member who fills his place.

Article II. The faculty convenes with no less than three members present, and examines but one at a time. The success of the candidate must be decided by a majority vote. If a division of the vote is for the rejecting of the candidate, this rejection is for one year.

Article III. The examination is made in the Dutch language, unless the faculty (board) consents to the use of a foreign language at the request of the candidate. All examinations are public unless the board otherwise decides.

Article IV. A dated certificate, and written in the Dutch language, signed by the president, or *loco* president, will be given to him who passes his examination successfully.

Article V. The day and hour for the examination are fixed by the president of the board, or *loco* president, which is communicated by the secretary to the parties concerned.

(Signed)

WILLEM,

Minister of Interior.

(Signed)

KAPPEYNE.

GRAVENHAGE, 12th February, 1879.



